Section 238126.13 – Split Ductless Systems
Capacity: 4 Ton Nominal – Heat Pump

Mitsubishi Model Number: MXZ-B multi split inverter heat pump series.

Variable capacity multi-zone System: MXZ-8B48NA Two to eight zones

Part 1 – General

1.01 System Description:

A. The heat pump air conditioning system shall be a Mitsubishi Electric MXZ-B variable capacity multi-zone series. The system shall consist of two (2) to eight (8) slim silhouette, compact, wall and/or floor mounted indoor fan coil sections with digital wireless remote controller, and/or ceiling suspended, ceiling recessed and/or low to mid profile ducted indoor units with a wired, wall mounted remote controller connected to a compact horizontal discharge outdoor unit which shall be of an inverter driven heat pump design.

B. Indoor unit model numbers shall be:

a. Wall Mounted; MSZ-GE06NA-8, MSZ-GE09NA-8, MSZ-GE12NA-8, MSZ-GE15NA-8, MSZ-GE18NA-8, MSZ-GE24NA, MSZ-FE09NA-8, MSZ-FE12NA-8 and MSZ-FE18NA.

b. Floor Standing; MFZ-KA09NA, MFZ-KA12NA and MFZ-KA18NA.

c. Ceiling Suspended; PCA-A24KA4.

d. Ceiling Recessed; SLZ-KA09NA, SLZ-KA12NA, SLZ-KA15NA, PLA-A18BA4, PLA-A24BA4.

e. Ducted; SEZ-KD09NA4, SEZ-KD12NA4, SEZ-KD15NA4, SEZ-KD18NA4 and PEAD-A24AA4.

C. Outdoor unit model numbers may be MXZ-8B48NA (2:1, 3:1, 4:1, 5:1, 6:1, 7:1 or 8:1) multi-zone systems.

1.02 Quality Assurance:

A. The system components shall be tested by a Nationally Recognized Testing Laboratory (NRTL) and shall bear the ETL label.
B. All wiring shall be in accordance with the National Electrical Code (N.E.C.).
C. The units shall be rated in accordance with Air-conditioning, Heating and Refrigeration Institute's (AHRI) Standard 240 and bear the AHRI Certification label.
D. The units shall be manufactured in a facility registered to ISO 9001 and ISO 14001, which is a set of standards applying to product and manufacturing quality and environmental management and protection set by the International Standard Organization (ISO).
E. A dry air holding charge shall be provided in the indoor section.

F. System efficiency shall meet or exceed 14.7 SEER when part of a multi system (2:1 / 3:1 / 4:1 / 5:1 / 6:1 / 7:1 / 8:1).

1.03 Delivery, Storage and Handling

A. Unit shall be stored and carefully handled according to the manufacturer's recommendations.

B. The wireless remote controller, for the wall mounted and floor standing indoor units, shall be shipped inside the carton and packaged with the indoor unit and shall be able to withstand 105°F storage temperatures and 95% relative humidity without adverse effect.

C. The remote controller, for the ceiling suspended, ceiling recessed and ducted indoor units, either wireless or wired, shall be shipped separately.

Part 2 – Warranty

2.01 The units shall have a manufacturer's parts and defects warranty for a period five (5) years from date of installation. The compressor shall have an extended warranty of seven (7) years from date of installation. If, during this period, any part should fail to function properly due to defects in workmanship or material, it shall be replaced or repaired at the discretion of the manufacturer. This warranty will not include labor.

2.02 Manufacturer shall have over 30 years of continuous experience in the U.S. market.

Part 3 – Outdoor Unit Products

3.01 Outdoor Units:

General:

The MXZ-B outdoor units shall be specifically designed to work with the MSZ-GE, MSZ-FE, MFZ-KA, SEZ-KD and SLZ-KA family of indoor units, as well as with the PLA-A18BA4, PLA-A24BA4, PCA-A24KA4 and PEAD-A24AA4 indoor models. The outdoor unit shall be completely factory assembled, piped and wired. Each unit shall be run tested at the factory prior to shipment. The table below shows the available outdoor and indoor combinations:

MXZ Indoor Combinations based on number of units						
2 Units	3 Units	4 Units	5 Units	6 Units	7 Units	8 Units
6+6	6+6+6	6+6+6+6	6+6+6+6+6	6+6+6+6+6+6	6+6+6+6+6+6+6	6+6+6+6+6+6+6+6
6+9	6+6+9	6+6+6+9	6+6+6+6+9	6+6+6+6+6+9	6+6+6+6+6+6+9	6+6+6+6+6+6+6+9
6+12	6+6+12	6+6+6+12	6+6+6+6+12	6+6+6+6+6+12	6+6+6+6+6+6+12	6+6+6+6+6+6+6+12
6+15	6+6+15	6+6+6+15	6+6+6+6+15	6+6+6+6+6+15	6+6+6+6+6+6+15	6+6+6+6+6+6+6+15
6+18	6+6+18	6+6+6+18	6+6+6+6+18	6+6+6+6+6+18	6+6+6+6+6+6+18	6+6+6+6+6+6+6+18
6+24	6+6+24	6+6+6+24	6+6+6+6+24	6+6+6+6+6+24	6+6+6+6+6+6+24	6+6+6+6+6+6+6+24
9+9	6+9+9	6+6+9+9	6+6+6+9+9	6+6+6+6+9+9	6+6+6+6+6+9+9	6+6+6+6+6+6+9+9
9+12	6+9+12	6+6+9+12	6+6+6+9+12	6+6+6+6+9+12	6+6+6+6+6+9+12	6+6+6+6+6+6+9+12
9+15	6+9+15	6+6+9+15	6+6+6+9+15	6+6+6+6+9+15	6+6+6+6+6+9+15	6+6+6+6+6+6+9+15
9+18	6+9+18	6+6+9+18	6+6+6+9+18	6+6+6+6+9+18	6+6+6+6+6+9+18	6+6+6+6+6+6+9+18
9+24	6+9+24	6+6+9+24	6+6+6+9+24	6+6+6+6+9+24	6+6+6+6+6+9+24	6+6+6+6+6+6+9+24
12+12	6+12+12	6+6+12+12	6+6+6+12+12	6+6+6+6+12+12	6+6+6+6+6+12+12	6+6+6+6+6+6+12+12
12+15	6+12+15	6+6+12+15	6+6+6+12+15	6+6+6+6+12+15	6+6+6+6+6+12+15	6+6+6+6+6+6+12+15
12+18	6+12+18	6+6+12+18	6+6+6+12+18	6+6+6+6+12+18	6+6+6+6+6+12+18	6+6+6+6+6+6+12+18
12+24	6+12+24	6+6+12+24	6+6+6+12+24	6+6+6+6+12+24	6+6+6+6+6+12+24	6+6+6+6+6+6+15+15
15+15	6+15+15	6+6+15+15	6+6+6+15+15	6+6+6+6+15+15	6+6+6+6+6+15+15	6+6+6+6+6+6+15+18
15+18	6+15+18	6+6+15+18	6+6+6+15+18	6+6+6+6+15+18	6+6+6+6+6+15+18	6+6+6+6+6+9+9+9
15+24	6+15+24	6+6+15+24	6+6+6+15+24	6+6+6+6+15+24	6+6+6+6+6+15+24	6+6+6+6+6+9+9+12
18+18	6+18+18	6+6+18+18	6+6+6+18+18	6+6+6+6+18+18	6+6+6+6+6+18+18	6+6+6+6+6+9+9+15
18+24	6+18+24	6+6+18+24	6+6+6+18+24	6+6+6+6+18+24	6+6+6+6+9+9+9	6+6+6+6+6+9+9+18
	6+24+24	6+6+24+24	6+6+6+24+24	6+6+6+9+9+9	6+6+6+6+9+9+12	6+6+6+6+6+9+12+12

	9+9+9	6+9+9+9	6+6+9+9+9	6+6+6+9+9+12	6+6+6+6+9+9+15	6+6+6+6+6+9+12+15
	9+9+12	6+9+9+12	6+6+9+9+12	6+6+6+9+9+15	6+6+6+6+9+9+18	6+6+6+6+6+9+12+18
	9+9+15	6+9+9+15	6+6+9+9+15	6+6+6+9+9+18	6+6+6+6+9+9+24	6+6+6+6+6+9+15+15
	9+9+18	6+9+9+18	6+6+9+9+18	6+6+6+9+9+24	6+6+6+6+9+12+12	6+6+6+6+6+12+12+12
	9+9+24	6+9+9+24	6+6+9+9+24	6+6+6+9+12+12	6+6+6+6+9+12+15	6+6+6+6+6+12+12+15
	9+12+12	6+9+12+12	6+6+9+12+12	6+6+6+9+12+15	6+6+6+6+9+12+18	6+6+6+6+9+9+9+9
	9+12+15	6+9+12+15	6+6+9+12+15	6+6+6+9+12+18	6+6+6+6+9+12+24	6+6+6+6+9+9+9+12
	9+12+18	6+9+12+18	6+6+9+12+18	6+6+6+9+12+24	6+6+6+6+9+15+15	6+6+6+6+9+9+9+15
	9+12+24	6+9+12+24	6+6+9+12+24	6+6+6+9+15+15	6+6+6+6+9+15+18	6+6+6+6+9+9+9+18
	9+15+15	6+9+15+15	6+6+9+15+15	6+6+6+9+15+18	6+6+6+6+9+18+18	6+6+6+6+9+9+12+12
	9+15+18	6+9+15+18	6+6+9+15+18	6+6+6+9+15+24	6+6+6+6+12+12+12	6+6+6+6+9+9+12+15
	9+15+24	6+9+15+24	6+6+9+15+24	6+6+6+9+18+18	6+6+6+6+12+12+15	6+6+6+6+9+12+12+12
	9+18+18	6+9+18+18	6+6+9+18+18	6+6+6+9+18+24	6+6+6+6+12+12+18	6+6+6+9+9+9+9+9
	9+18+24	6+9+18+24	6+6+9+18+24	6+6+6+12+12+12	6+6+6+6+12+15+15	6+6+6+9+9+9+9+12
	9+24+24	6+9+24+24	6+6+9+24+24	6+6+6+12+12+15	6+6+6+6+12+15+18	6+6+6+9+9+9+9+15
	12+12+12	6+12+12+12	6+6+12+12+12	6+6+6+12+12+18	6+6+6+6+15+15+15	6+6+6+9+9+9+12+12
	12+12+15	6+12+12+15	6+6+12+12+15	6+6+6+12+12+24	6+6+6+9+9+9+9	6+6+9+9+9+9+9+9
	12+12+18	6+12+12+18	6+6+12+12+18	6+6+6+12+15+15	6+6+6+9+9+9+12	6+6+9+9+9+9+9+12
	12+12+24	6+12+12+24	6+6+12+12+24	6+6+6+12+15+18	6+6+6+9+9+9+15	6+9+9+9+9+9+9+9
	12+15+15	6+12+15+15	6+6+12+15+15	6+6+6+12+15+24	6+6+6+9+9+9+18	
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	15+18+18	6+15+18+18	6+6+15+18+24	6+6+9+9+9+24	6+6+6+9+12+12+18	
	15+18+24	6+15+18+24	6+6+18+18+18	6+6+9+9+12+12	6+6+6+9+12+15+15	
	15+24+24	6+15+24+24	6+9+9+9+9	6+6+9+9+12+15	6+6+6+12+12+12+12	
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	18+18+24	6+18+18+24	6+9+9+9+15	6+6+9+9+12+24	6+6+9+9+9+9+9	
	18+24+24	9+9+9+9	6+9+9+9+18	6+6+9+9+15+15	6+6+9+9+9+9+12	
		9+9+9+12	6+9+9+9+24	6+6+9+9+15+18	6+6+9+9+9+9+15	
		9+9+9+15	6+9+9+12+12	6+6+9+9+15+24	6+6+9+9+9+9+18	
		9+9+9+18	6+9+9+12+15	6+6+9+9+18+18	6+6+9+9+9+12+12	
		9+9+9+24	6+9+9+12+18	6+6+9+12+12+12	6+6+9+9+9+12+15	
		9+9+12+12	6+9+9+12+24	6+6+9+12+12+15	6+6+9+9+9+12+18	
		9+9+12+15	6+9+9+15+15	6+6+9+12+12+18	6+6+9+9+9+15+15	
		9+9+12+18	6+9+9+15+18	6+6+9+12+12+24	6+6+9+9+12+12+12	
		9+9+12+24	6+9+9+15+24	6+6+9+12+15+15	6+6+9+9+12+12+15	
		9+9+15+15	6+9+9+18+18	6+6+9+12+15+18	6+6+9+12+12+12+12	
		9+9+15+18	6+9+9+18+24	6+6+9+12+18+18	6+9+9+9+9+9+9	
		9+9+15+24	6+9+12+12+12	6+6+9+15+15+15	6+9+9+9+9+9+12	
		9+9+18+18	6+9+12+12+15	6+6+9+15+15+18	6+9+9+9+9+9+15	
		9+9+18+24	6+9+12+12+18	6+6+12+12+12+12	6+9+9+9+9+9+18	
		9+9+24+24	6+9+12+12+24	6+6+12+12+12+15	6+9+9+9+9+12+12	
		9+12+12+12	6+9+12+15+15	6+6+12+12+12+18	6+9+9+9+9+12+15	
		9+12+12+15	6+9+12+15+18	6+6+12+12+15+15	6+9+9+9+12+12+12	
		9+12+12+18	6+9+12+15+24	6+6+12+12+15+18	9+9+9+9+9+9+9	
		9+12+12+24	6+9+12+18+18	6+6+12+15+15+15	9+9+9+9+9+9+12	
		9+12+15+15	6+9+12+18+24	6+9+9+9+9+9	9+9+9+9+9+9+15	
		9+12+15+18	6+9+15+15+15	6+9+9+9+9+12	9+9+9+9+9+12+12	
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		9+12+18+18	6+9+15+15+24	6+9+9+9+9+18		
		9+12+18+24	6+9+15+18+18	6+9+9+9+9+24		
		9+12+24+24	6+9+18+18+18	6+9+9+9+12+12		
		9+15+15+15	6+12+12+12+12	6+9+9+9+12+15		
		9+15+15+18	6+12+12+12+15	6+9+9+9+12+18		
		9+15+15+24	6+12+12+12+18	6+9+9+9+12+24		
		9+15+18+18	6+12+12+12+24	6+9+9+9+15+15		
		9+15+18+24	6+12+12+15+15	6+9+9+9+15+18		
		9+18+18+18	6+12+12+15+18	6+9+9+9+18+18		
		9+18+18+24	6+12+12+15+24	6+9+9+12+12+12		
		12+12+12+12	6+12+12+18+18	6+9+9+12+12+15		
		12+12+12+15	6+12+15+15+15	6+9+9+12+12+18		
		12+12+12+18	6+12+15+15+18	6+9+9+12+15+15		
		12+12+12+24	6+12+15+18+18	6+9+9+12+15+18		
		12+12+15+15	6+15+15+15+15	6+9+9+15+15+15		
		12+12+15+18	6+15+15+15+18	6+9+12+12+12+12		
		12+12+15+24	9+9+9+9+9	6+9+12+12+12+15		
		12+12+18+18	9+9+9+9+12	6+9+12+12+12+18		
		12+12+18+24	9+9+9+9+15	6+9+12+12+15+15		
		12+15+15+15	9+9+9+9+18	6+12+12+12+12+12		

		12+15+15+18	9+9+9+9+24	6+12+12+12+12+15		
		12+15+15+24	9+9+9+12+12	9+9+9+9+9+9		
		12+15+18+18	9+9+9+12+15	9+9+9+9+9+12		
		12+15+18+24	9+9+9+12+18	9+9+9+9+9+15		
		12+18+18+18	9+9+9+12+24	9+9+9+9+9+18		
		15+15+15+15	9+9+9+15+15	9+9+9+9+9+24		
		15+15+15+18	9+9+9+15+18	9+9+9+9+12+12		
		15+15+15+24	9+9+9+15+24	9+9+9+9+12+15		
		15+15+18+18	9+9+9+18+18	9+9+9+9+12+18		
		15+18+18+18	9+9+9+18+24	9+9+9+9+15+15		
			9+9+12+12+12	9+9+9+9+15+18		
			9+9+12+12+15	9+9+9+12+12+12		
			9+9+12+12+18	9+9+9+12+12+15		
			9+9+12+12+24	9+9+9+12+12+18		
			9+9+12+15+15	9+9+9+12+15+15		
			9+9+12+15+18	9+9+12+12+12+12		
			9+9+12+15+24	9+9+12+12+12+15		
			9+9+12+18+18	9+12+12+12+12+12		
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A. Unit Cabinet:

1. The casing shall be fabricated of galvanized steel, bonderized, finished with an electrostatically applied, thermally fused acrylic or polyester powder coating for corrosion protection. Assembly hardware shall be cadmium plated for weather resistance.
2. Cabinet color shall be Munsell 3Y 7.8/1.1.
3. Two (2) mild steel mounting feet, traverse mounted across the cabinet base pan, welded mount, providing four (4) slotted mounting holes shall be furnished. Assembly shall withstand lateral wind gust up to 155 MPH to meet applicable weather codes.

B. Fan:

1. The unit shall be furnished with a direct drive, high performance propeller type fan.
2. The condenser fan motor shall be a variable speed, direct current (DC) motor and shall have permanently lubricated bearings.
3. Fan speed shall be switch automatically according to the number of operating indoor units and the compressor operating frequency.
4. The fan motor shall be mounted with vibration isolation for quiet operation.
5. The fan shall be provided with a raised guard to prevent contact with moving parts.
6. The outdoor unit shall have horizontal discharge airflow.
7. Outdoor unit sound level shall not exceed:

Model	Cooling	Heating
MXZ-8B48NA	54 dB(A)	55 dB(A)

C. Coil:

1. The outdoor unit coil shall be of nonferrous construction with lanced or corrugated plate fins on copper tubing.
2. The coil shall be protected with an integral guard.
3. Refrigerant flow from the outdoor unit to the indoor units shall be independently controlled by means of individual electronic linear expansion valves for each indoor unit.
4. Outdoor unit shall be pre-charged with sufficient R-410a refrigerant for up to one hundred and thirty-one (131) feet of refrigerant piping.
5. All refrigerant lines between outdoor and indoor units shall be of annealed, refrigeration grade copper tubing, ARC Type, meeting ASTM B280 requirements, individually insulated in twin-tube, flexible, closed-cell, CFC-free (ozone depletion potential of zero), elastomeric material for the insulation of refrigerant pipes and tubes with thermal conductivity equal to or better than 0.27 BTU-inch/hour per Sq Ft / °F, a water vapor transmission equal to or better than 0.08 Perm-inch and superior fire ratings such that insulation will not contribute significantly to fire and up to 1" thick insulation shall have a Flame-Spread Index of less than 25 and a Smoke-development Index of less than 50 as tested by ASTM E 84 and CAN / ULC S-102.
6. All refrigerant connections between outdoor and indoor units shall be flare type.

D. Compressor:

1. The compressor shall be a high performance, hermetic, inverter driven, variable speed, dual rotary type manufactured by Mitsubishi Electric Corporation.
2. The compressor motor shall be direct current (DC) type equipped with a factory supplied and installed inverter drive package.
3. The outdoor unit shall be equipped with a suction side refrigerant accumulator.
4. The compressor will be equipped with an internal thermal overload.
5. The compressor shall be mounted to avoid the transmission of vibration.

E. Branch Boxes:

The outdoor unit shall have a 3/8" liquid line connection and a 5/8" gas line connection. Pipe lines running from the outdoor unit shall connect to a 3-port, a 5-port branch box, or a combination of both. The port connections on the branch boxes are as described in the table below:

Branch Box Model Number		PAC-AKA31BC			PAC-AKA51BC				
Outdoor Unit to Branch Box	Liquid line	3/8"			3/8"				
	Gas line	5/8"			5/8"				
Branch Box to Indoor Unit	Port Connections	A	B	C	A	B	C	D	E
	Liquid line	¼"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"
	Gas line	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"	1/2"

The outdoor unit must be connected to at least one branch box. It can also be connected to two 3-port branch boxes, to one 3-port and one 5-port branch box, or to two 5-port branch boxes (At least two ports have to be left unused in this case).

The branch boxes shall be installed indoors in an area with a temperature between 67ºF and 95ºF and a relative humidity of 80% or lower.

F. Piping Requirements:
The outdoor unit must have the ability to operate within the following refrigerant piping and height limitations without the need for line size changes, traps or additional oil.
Piping Lengths:

Model	MXZ-8B48NA
Height Differential – Indoor unit above outdoor unit	66 feet (Max)
Height Differential – Indoor unit below outdoor unit	98 feet (Max)
Distance between outdoor unit and farthest indoor unit	230 feet (Max)
Distance between outdoor unit and branch box	180 feet (Max)
Length from branch box to farthest indoor unit	49 feet (Max)
Total length between branch box and all connected indoor units	197 feet (Max)
Total Length	377 feet (Max)

G. Electrical:
1. The unit electrical power shall be 208/230 volts, 1-phase, 60 hertz.
2. The unit shall be capable of satisfactory operation within voltage limits of 187 volts to 253 volts.
3. The outdoor unit shall be controlled by the microprocessors located in the indoor unit and in the outdoor unit communicating system status, operation, and instructions digitally over A-Control – a system directing that the indoor unit be powered directly from the outdoor unit using a 3-wire, 14 gauge AWG connection plus ground.
4. The outdoor unit shall be equipped with Pulse Amplitude Modulation (PAM) compressor inverter drive control for maximum efficiency with minimum power consumption.

Part 4 – Indoor Unit Products

4.01 Wall Mounted MSZ-GE**NA Indoor Units:

A. General:
The indoor unit shall be fully factory assembled, wired and run tested prior to shipment. Contained within the indoor unit shall be all factory wiring, piping, control circuit board, fan, and fan motor. The unit shall have a self-diagnostic function, 3-minute restart time delay mechanism, an auto restart function, an emergency / test operation. Indoor unit shall be charged with dry air before shipment from factory.

B. Unit Cabinet:
1. The casing shall have a white finish– Munsell 1.0Y 9.2/0.2.
2. Multi directional drain and refrigerant piping, offering three (3) direction pipe alignment for all refrigerant piping and two (2) direction pipe alignment for condensate draining shall be standard.
3. There shall be a separate back plate that secures the indoor unit firmly to the wall. The installation-plate shall be securely attached to the wall using appropriate anchor method.

Installing contractor shall determine the best method and be responsible for proper mounting of the installation plate to the wall.

C. Fan:

1. The indoor unit fan shall be an assembly with a line-flow fan direct driven by a single motor.
2. The fan shall be statically and dynamically balanced and run on a motor with permanently lubricated bearing.
3. A manual adjustable guide vane shall be provided with the ability to change the airflow from side to side (left to right).
4. An integral, motorized, multi-position, horizontal air sweep flow louver shall provide for uniform air distribution, up and down. Five (5) positions plus Auto and Swing shall be provided, controlled from the remote controller.
5. The indoor fan shall operate at one of five (5) speeds: Super High, High, Medium, Low, and Quiet plus Auto Fan Mode for models up to 18,000 BTU/h, and four (4) speeds: Powerful, High, Medium and Low plus Auto Fan Mode for the 24,000 BTU/h model. All speeds shall be selected from the remote controller.
6. Indoor unit sound level shall not exceed:

Model / Speed		Super High	High	Medium	Low	Quiet
MSZ-GE06NA-8	Cooling dB(A)	43	37	30	22	19
	Heating dB(A)	43	37	30	22	19
MSZ-GE09NA-8	Cooling dB(A)	43	37	30	22	19
	Heating dB(A)	43	37	30	22	19
MSZ-GE12NA-8	Cooling dB(A)	45	37	30	22	19
	Heating dB(A)	43	37	30	22	19
MSZ-GE15NA-8	Cooling dB(A)	49	44	38	32	26
	Heating dB(A)	46	40	35	30	26
MSZ-GE18NA-8	Cooling dB(A)	49	44	38	33	28
	Heating dB(A)	49	43	38	33	28

Model / Speed		Powerful	High	Medium	Low
MSZ-GE24NA	Cooling dB(A)	53	49	41	34
	Heating dB(A)	52	49	41	32

D. Filter:

1. Return air shall be filtered by means of an easily removed, washable, Catechin, Antioxidant Pre-filter and a separate Anti-allergy enzyme filter – blue, pleated type.

E. Coil:

1. The indoor unit coil shall be of nonferrous construction with smooth plate fins on copper tubing.
2. The refrigerant tubing shall have inner groves for high efficiency heat exchange.
3. All tube joints shall be brazed with PhosCopper or silver alloy.
4. The coils shall be pressure tested at the factory.
5. A sloped, corrosion resistant condensate pan with drain shall be provided under the coil.

6. An optional drain pan level switch (DPLS1), designed to connect to the control board, shall be provided if required, and installed on the condensate pan to prevent condensate from overflowing.

F. Electrical:
   1. The indoor unit electrical power shall be 208 / 230 volts, 1-phase, 60 hertz.
   2. The system shall be equipped with A-Control – a system allowing each indoor unit to be powered and controlled directly from the outdoor unit using a 14 gauge (AWG) 3-wire connection plus ground providing both primary power and integrated, by-directional, digital control signal without additional connections.
   3. The indoor units shall not have any supplemental or "back-up" electrical heating elements.

G. Control:
   1. The unit shall have a wireless hand held controller to perform input functions necessary to operate the system.
   2. The wireless hand held controller shall have a Power On/Off switch, Mode Selector – Cool, Dry, Heat, Auto Modes - Temperature Setting, Timer Control, Fan Speed Select and Auto Vane selector.
   3. The indoor unit shall perform Self-diagnostic Function and Check Mode switching.
   4. Temperature changes shall be by 1ºF increments with a range of 61 - 88ºF.
   5. The microprocessor located in the indoor unit shall have the capability of sensing return air temperature and indoor coil temperature, receiving and processing commands from the wireless or a wired controller, providing emergency operation and controlling the outdoor unit.
   6. The system shall be capable of automatically restarting and operating at the previously selected conditions when the power is restored after power interruption.
   7. Control system shall control the continued operation of the air sweep louvers, as well as provide On/Off, System/Mode function.
   8. The indoor unit shall have the option of either a wireless or wired wall mounted remote controller to be ordered separately:
      a. Wireless, wall mounted remote controller kit (MHK1)
         The Wireless, wall mounted remote controller kit (MHK1) shall consist of a wireless, wall mounted controller (MRCH1), a wireless receiver (MIFH1) and a cable (MRC1) to connect the receiver to the indoor unit. The controller shall be white in color with a light-green LCD display and a backlight feature. The MRCH1 shall consist of four Function buttons below the display, and Increase/Decrease Set Temperature buttons and a Hold button to the right of the display. The controller shall have a built-in temperature sensor and a battery holder, using two AA alkaline batteries. Temperature shall be displayed in either Fahrenheit (°F) or Celsius (°C), and temperature changes shall be by increments of 1°F (0.5°C).
         The MHK1 uses Honeywell RedLINK™ technology, and the wireless receiver is specially designed for Mitsubishi units. Linking to the wireless network shall be done from the receiver and from the remote controller. There shall not be any interference with other wireless devices or neighboring RedLINK™ products. Communication shall be automatically restored after power resumes and after batteries are replaced.
         The basic functions are:

Wireless, Wall Mounted Remote Controller Kit (MHK1)	
Item	**Description**
Number of Units Controllable	1 unit
ON/OFF	Run and stop operation
Operation Mode	Switches between Cool/Drying/Auto/Fan/Heat.
Temperature Setting (Range and modes depend on connected unit model)	Controller general setpoint temperature range: Cool/Dry: 50°F-99°F Heat: 40°F-90°F Auto: 50°F-90°F Controller temperature range when connected to the MSZ-GE/MXZ system: Cool/Dry: 61°F-88°F Heat: 61°F-88°F Auto: 61°F-88°F
Fan Speed Setting (Range and modes depend on connected unit model)	Hi/Mid-2/Mid-1/Low/Auto
Air Flow Direction Setting (Air flow direction settings depend on the unit model)	Air flow direction angles 100%-80%-60%-40%, Swing.
Dual Setpoint Control	Separate heating and cooling setpoints. Adjustable deadband from 2ºF to 8ºF. Automatically adjusts setpoints to ensure deadband. System changeover with dual setpoints.
Scheduling	5-2 and 5-1-1 schedules Separate Heat/Cool schedules Allows operation in AUTO with Scheduling setbacks and dual setpoint Simple temperature setting can be done up to 4 times per day in the week. The time can be set by the 15-minute interval. Remote controller shall be programmable as either a residential controller, which will offer residential scheduling options only; or as a commercial controller, which will offer commercial scheduling options only.
Optimal Start	Set occupied time and desired set temperature Remote controller learns when to start warm up or cool down so that space is at set temperature at start of occupied time

Wireless, Wall Mounted Remote Controller Kit (MHK1)	
Item	**Description**
Operating Conditions Display	Setpoint and room temperature. Default sensing is at the remote controller. Installer setting to select at return air sensor. Automatically switches to return air sensor if communication to remote controller is lost Outdoor temperature and humidity (Requires optional air sensor MOS1)
Additional Functions	Hold Function Temporary Schedule Override Reset to factory default
Error	When an error is currently occurring on an air conditioner unit, the afflicted unit and the error code are displayed
Auto Lock Out Function	Setting/releasing of simplified locking for remote control settings can be performed. • Locking of all settings • Locking of ON/OFF setting • Locking of system setting (Heat, Cool, Off, Auto, etc.) • Locking of fan setting • Locking of temperature setting • Locking of Clock/Day/Schedule

Two optional devices can be used with the MHK1 controller kit. These are, an outdoor air sensor (MOS1), which allows the display of the outdoor temperature and humidity, and a portable central controller (MCCH1), which can control up to 16 zones with On/Off, set temperature, heat/cool mode selection and auto-off timer.

b. Wired Remote Controller (PAR-21MAA)
The Wired Remote Controller PAR-21MAA shall require a MAC-397IF-E MA Series Terminal Interface for communications. Interface will be mounted at the indoor unit. A two (2) conductor, stranded, 22 AWG twisted pair, jacketed, cable shall connect the MAC-397IF-E to the PAR-21MAA wall controller. Connection shall not be polarity sensitive and controller wire shall not exceed thirty-three (33) feet (10m) length.
The wired remote controller shall be approximately 5” x 5” in size and white in color with a light-green LCD display. The PAR-21MAA shall support a selection from multiple languages (Spanish, German, Japanese, Chinese, English, Russian, Italian, or French) for display information. There shall be a built-in weekly timer with up to 8 pattern settings per day. The controller shall consist of an On/Off button, Increase/Decrease Set Temperature buttons, a Cool/Auto/Fan/Dry mode selector, a Timer Menu button, a Timer On/Off button, Set Time buttons, a Fan Speed selector, a Ventilation button, a Test Run button, and a Check Mode button. The controller

shall have a built-in temperature sensor. Temperature shall be displayed in either Fahrenheit (°F) or Celsius (°C), and Temperature changes shall be by increments of 1°F (0.5°C). The PAR-21MAA shall have the capability of controlling up to a maximum of 16 systems, as a group with the same mode and set-point for all, at a maximum developed control cable distance of 1,500 feet (500 meters).
The basic functions are:

Wired Remote Controller (PAR-21MAA)	
Item	**Description**
Number of Units Controllable	16 units as 1 group
ON/OFF	Run and stop operation
Operation Mode	Switches between Cool/Dry/Auto/Fan/Heat.
Temperature Setting (Range and modes depend on connected unit model)	Sets the setpoint temperature in the following range Cool/Dry: 67°F-87°F Heat: 63°F-83°F Auto: 67°F-83°F
Fan Speed Setting (Range and modes depend on connected unit model)	Hi/Mid-2/Mid-1/Low/Auto
Air Flow Direction Setting (Air flow direction settings depend on the unit model)	Air flow direction angles 100%-80%-60%-40%, Swing.
Weekly Scheduler	ON/OFF/Temperature setting can be done up to 8 times one day in the week. The time can be set by the 1-minute interval.
Operating Conditions Display	Setpoint and room temperature. Sensing can be done at the remote controller or the indoor unit depending on the indoor unit dipswitch setting Liquid, discharge, indoor and outdoor pipe temperatures LEV opening pulses, sub cooling and discharge super heat Compressor Operating Conditions: Running current, frequency, input voltage, On/Off status and operating time
Error	When an error is currently occurring on an air conditioner unit, the afflicted unit and the error code are displayed
Ventilation Equipment	Up to 16 indoor units can be connected to an interlocked system that has one LOSSNAY unit. LOSSNAY items that can be set are “Hi”, “Low”, and “Stop”. Ventilation mode switching is not available.

Wired Remote Controller (PAR-21MAA)	
Item	**Description**
Auto Lock Out Function	Setting/releasing of simplified locking for remote control buttons can be performed. • Locking of all buttons • Locking of all buttons except ON/OFF button

9. The indoor units shall be capable of working with single-zone or multi-zone outdoor units

4.02. Wall Mounted MSZ-FE**NA Indoor Units:

A. General:
The indoor unit shall be factory assembled, wired and run tested. Contained within the unit shall be all factory wiring, piping, control circuit board, fan and fan motor. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, and an auto restart function. Indoor unit shall be charged with dry air before shipment from factory.

B. Unit Cabinet:
1. The casing shall have a white finish – Munsell 1.0Y 9.2/0.2.
2. Multi directional drain connection and refrigerant piping, offering three (3) direction pipe alignments for all refrigerant piping and two (2) direction pipe alignments for condensate draining shall be standard.
3. There shall be a separate, metal back-plate that secures the indoor unit firmly to the wall. The back plate shall be securely attached to the wall. The installation-plate shall be securely attached to the wall using appropriate anchor method. Installing contractor shall determine the best method and be responsible for proper mounting of the installation plate to the wall.

C. Fan:
1. The indoor unit fan shall be an assembly with a line-flow fan direct driven by a single motor.
2. The fan shall be statically and dynamically balanced and be powered by a motor with permanently lubricated bearing.
3. An integral, motorized, multi-position, horizontal air sweep vane shall provide for uniform air distribution, up and down. Vane shall have 5 selectable positions plus AUTO (Controls position based upon mode, microprocessor shall automatically determine the vane angle to provide the optimum room temperature distribution) and SWING (Continuously moves up and down). In OFF mode the horizontal vane shall return to the closed position.
4. A motorized adjustable vertical guide vane shall be provided with the ability to change the airflow from side to side (left to right). Vane shall be positioned by a stepper motor driven by the indoor unit control microprocessor. Vane shall have 5 selectable positions and SWING (Continuously moves left and right).
5. The indoor fan shall operate at any of four (4) selectable speeds: Powerful, High, Medium, and Low.
Indoor unit sound level shall not exceed:

Model / Speed		Powerful	High	Medium	Low
MSZ-FE09NA-8	Cooling dB(A)	42	39	31	22
	Heating dB(A)	42	40	31	22
MSZ-FE12NA-8	Cooling dB(A)	45	43	33	22
	Heating dB(A)	44	43	33	22
MSZ-FE18NA	Cooling dB(A)	53	49	41	34
	Heating dB(A)	52	49	41	32

D. Filter:
1. Return air shall be filtered by means of (2) easily removed, Hybrid Catechin pre filters, a Blue-Enzyme Filter with permanently charged surface and a Platinum Catalyst Deodorizing Filter with ceramic surface and pore sizes ranging from 1 to 10 nanometers.

E. Coil:
1. The indoor unit coil shall be of nonferrous construction with smooth plate fins on copper tubing.
2. The tubing shall have inner groves for high efficiency heat exchange.
3. All tube joints shall be brazed with PhosCopper or silver alloy.
4. The coils shall be pressure tested at the factory.
5. A sloped, corrosion resistant condensate pan with drain shall be provided under the coil.
6. An optional drain pan level switch (DPLS1), designed to connect to the control board, shall be provided if required, and installed on the condensate pan to prevent condensate from overflowing.

F. Electrical:
1. The indoor unit electrical power shall be 208-230 volts, 1-phase, 60 hertz.
2. The system shall be equipped with A-Control – a system directing that the indoor unit be powered directly from the outdoor unit using a 3-wire, 14 ga. AWG connection plus ground.
3. The indoor unit shall not have any supplemental electrical heat elements.

G. Control:
1. The unit shall have a hand held wireless controller to perform input functions necessary to operate the system.
2. The hand held wireless controller shall have a Power On/Off switch, Mode Selector – Cool, Dry, Heat, Auto Modes - Temperature Setting, Timer Control, Fan Speed Select and Auto Vane selector.
3. The indoor unit shall perform Self-diagnostic Function and Check Mode switching.
4. Temperature changes shall be by 1ºF increments with a range of 61 - 88ºF.
5. The microprocessor located in the indoor unit shall have the capability of sensing return air temperature and indoor coil temperature, receiving and processing commands from the wireless or a wired controller, providing emergency operation and controlling the outdoor unit.
6. MSZ-FE09NA-8 and MSZ-FE12NA-8 indoor units shall be equipped with “i-see® Sensor” technology as a standard feature, providing uniform temperature detection and response to equalize temperature from floor to ceiling.

7. The system shall be capable of automatically restarting and operating at the previously selected conditions when the power is restored after power interruption.
8. Control system shall control the continued operation of the air sweep louvers, as well as provide On/Off, System/Mode function.
9. The indoor unit shall have the option of either a wireless or wired wall mounted remote controller to be ordered separately:
    a. Wireless, wall mounted remote controller kit (MHK1)
    The Wireless, wall mounted remote controller kit (MHK1) shall consist of a wireless, wall mounted controller (MRCH1), a wireless receiver (MIFH1) and a cable (MRC1) to connect the receiver to the indoor unit. The controller shall be white in color with a light-green LCD display and a backlight feature. The MRCH1 shall consist of four Function buttons below the display, and Increase/Decrease Set Temperature buttons and a Hold button to the right of the display. The controller shall have a built-in temperature sensor and a battery holder, using two AA alkaline batteries. Temperature shall be displayed in either Fahrenheit (°F) or Celsius (°C), and temperature changes shall be by increments of 1°F (0.5°C).
    The MHK1 uses Honeywell RedLINK™ technology, and the wireless receiver is specially designed for Mitsubishi units. Linking to the wireless network shall be done from the receiver and from the remote controller. There shall not be any interference with other wireless devices or neighboring RedLINK™ products. Communication shall be automatically restored after power resumes and after batteries are replaced.
    The basic functions are:

Wireless, Wall Mounted Remote Controller (MHK1)	
Item	**Description**
Number of Units Controllable	1 unit
ON/OFF	Run and stop operation
Operation Mode	Switches between Cool/Drying/Auto/Fan/Heat.
Temperature Setting (Range and modes depend on connected unit model)	Controller general setpoint temperature range: Cool/Dry: 50°F-99°F Heat: 40°F-90°F Auto: 50°F-90°F Controller temperature range when connected to the MSZ-FE/MXB system: Cool/Dry: 61°F-88°F Heat: 61°F-88°F Auto: 61°F-88°F
Fan Speed Setting (Range and modes depend on connected unit model)	Hi/Mid-2/Mid-1/Low/Auto
Air Flow Direction Setting (Air flow direction settings depend on the unit model)	Air flow direction angles 100%-80%-60%-40%, Swing.

Wireless, Wall Mounted Remote Controller (MHK1)	
Item	**Description**
Dual Setpoint Control	Separate heating and cooling setpoints. Adjustable deadband from 2ºF to 8ºF. Automatically adjusts setpoints to ensure deadband. System changeover with dual setpoints.
Scheduling	5-2 and 5-1-1 schedules Separate Heat/Cool schedules Allows operation in AUTO with Scheduling setbacks and dual setpoint. Simple temperature setting can be done up to 4 times one day in the week. The time can be set by the 15-minute interval. Remote controller shall be programmable as either a residential controller, which will offer residential scheduling options only; or as a commercial controller, which will offer commercial scheduling options only.
Optimal Start	Set occupied time and desired set temperature Remote controller learns when to start warm up or cool down so that space is at set temperature at start of occupied time
Operating Conditions Display	Setpoint and room temperature. Default sensing is at the remote controller. Installer setting to select at return air sensor. Automatically switches to return air sensor if communication to remote controller is lost Outdoor temperature and humidity (Requires optional air sensor MOS1)
Additional Functions	Hold Function Temporary Schedule Override Reset to factory default
Error	When an error is currently occurring on an air conditioner unit, the afflicted unit and the error code are displayed
Auto Lock Out Function	Setting/releasing of simplified locking for remote control settings can be performed. • Locking of all settings • Locking of ON/OFF setting • Locking of system setting (Heat, Cool, Off, Auto, etc.) • Locking of fan setting • Locking of temperature setting • Locking of Clock/Day/Schedule

Two optional devices can be used with the MHK1 controller kit. These are, an outdoor air sensor (MOS1), which allows the display of the outdoor temperature and humidity, and a portable central controller (MCCH1), which can control up to 16 zones with On/Off, set temperature, heat/cool mode selection and auto-off timer.

b. Wired Remote Controller (PAR-21MAA)
The Wired Remote Controller PAR-21MAA shall require a MAC-397IF-E MA Series Terminal Interface for communications. Interface will be mounted at the indoor unit. A two (2) conductor, stranded, 22 AWG twisted pair, jacketed, cable shall connect the MAC-397IF-E to the PAR-21MAA wall controller. Connection shall not be polarity sensitive and controller wire shall not exceed thirty-three (33) feet (10M) length.
The wired remote controller shall be approximately 5" x 5" in size and white in color with a light-green LCD display. The PAR-21MAA shall support a selection from multiple languages (Spanish, German, Japanese, Chinese, English, Russian, Italian, or French) for display information. There shall be a built-in weekly timer with up to 8 pattern settings per day. The controller shall consist of an On/Off button, Increase/Decrease Set Temperature buttons, a Cool/Auto/Fan/Dry mode selector, a Timer Menu button, a Timer On/Off button, Set Time buttons, a Fan Speed selector, a Ventilation button, a Test Run button, and a Check Mode button. The controller shall have a built-in temperature sensor. Temperature shall be displayed in either Fahrenheit (°F) or Celsius (°C), and Temperature changes shall be by increments of 1°F (0.5°C). The PAR-21MAA shall have the capability of controlling up to a maximum of 16 systems, as a group with the same mode and set-point for all, at a maximum developed control cable distance of 1,500 feet (500 meters).
The basic functions are:

Wired Remote Controller (PAR-21MAA)	
Item	**Description**
Number of Units Controllable	16 units as 1 group
ON/OFF	Run and stop operation
Operation Mode	Switches between Cool/Dry/Auto/Fan/Heat.
Temperature Setting (Range and modes depend on connected unit model)	Sets the setpoint temperature in the following range Cool/Dry: 67°F-87°F Heat: 63°F-83°F Auto: 67°F-83°F
Fan Speed Setting (Range and modes depend on connected unit model)	Hi/Mid-2/Mid-1/Low/Auto
Air Flow Direction Setting (Air flow direction settings depend on the unit model)	Air flow direction angles 100%-80%-60%-40%, Swing.
Weekly Scheduler	ON/OFF/Temperature setting can be done up to 8 times one day in the week. The time can be set by the 1-minute interval.

Wired Remote Controller (PAR-21MAA)	
Item	**Description**
Operating Conditions Display	Setpoint and room temperature. Sensing can be done at the remote controller or the indoor unit depending on the indoor unit dipswitch setting Liquid, discharge, indoor and outdoor pipe temperatures LEV opening pulses, sub cooling and discharge super heat Compressor Operating Conditions: Running current, frequency, input voltage, On/Off status and operating time
Error	When an error is currently occurring on an air conditioner unit, the afflicted unit and the error code are displayed
Ventilation Equipment	Up to 16 indoor units can be connected to an interlocked system that has one LOSSNAY unit. LOSSNAY items that can be set are “Hi”, “Low”, and “Stop”. Ventilation mode switching is not available.
Auto Lock Out Function	Setting/releasing of simplified locking for remote control buttons can be performed. • Locking of all buttons • Locking of all buttons except ON/OFF button

10. The indoor units shall be capable of working with single-zone or multi-zone outdoor units

4.03. Floor Standing MFZ-KA**NA Indoor Units:

A. General:
The indoor unit shall be factory assembled, wired and run tested. Contained within the unit shall be all factory wiring, piping, control circuit board, fan and fan motor. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, and an auto restart function. Indoor unit shall be charged with dry air before shipment from factory.

B. Unit Cabinet:

1. The casing shall have a white finish – Munsell 1.0Y 9.2/0.2.
2. Multi directional drain connection and refrigerant piping, offering three (3) direction pipe alignments for all refrigerant piping and two (2) direction pipe alignments for condensate draining shall be standard.
3. There shall be a separate, metal back-plate that secures the indoor unit firmly to the wall. The back plate shall be securely attached to the wall.
4. The unit shall be mountable on the floor. The base of the unit is designed so that it can be securely attached to the floor.

C. Fan:

1. The indoor unit fan shall be an assembly with a line-flow fan direct driven by a single motor.
2. The fan shall be statically and dynamically balanced and be powered by a motor with permanently lubricated bearing.
3. A manual adjustable guide vane shall be provided with the ability to change the airflow from side to side (left to right).
4. An integral, motorized, multi-position, horizontal air sweep flow louver shall provide for uniform air distribution, up and down from the upper air outlet. Five (5) positions plus Auto and Swing shall be provided, controlled from the remote controller. The lower air outlet can only work simultaneously with the upper one, and the airflow through it is controlled automatically.
5. The indoor fan shall operate at one of four (4) speeds: Super High, High, Medium and Low Mode selected from the remote controller.
6. Indoor unit sound level shall not exceed:

Model / Speed		Super High	High	Medium	Low
MFZ-KA09NA	Cooling dB(A)	40	35	30	25
	Heating dB(A)	40	35	30	25
MFZ-KA12NA	Cooling dB(A)	41	36	31	26
	Heating dB(A)	41	36	31	28
MFZ-KA18NA	Cooling dB(A)	46	42	38	35
	Heating dB(A)	46	42	38	35

D. Filter:

1. Return air shall be filtered by means of easily removed, Hybrid Catechin pre filter, Blue-Enzyme Filter with permanently charged surface and a Platinum Catalyst Deodorizing Filter with ceramic surface and pore sizes ranging from 1 to 10 nanometers.

E. Coil:

1. The indoor unit coil shall be of nonferrous construction with smooth plate fins on copper tubing.
2. The tubing shall have inner groves for high efficiency heat exchange.
3. All tube joints shall be brazed with PhosCopper or silver alloy.
4. The coils shall be pressure tested at the factory.
5. A sloped, corrosion resistant condensate pan with drain shall be provided under the coil.
6. An optional drain pan level switch (DPLS1), designed to connect to the control board, shall be provided if required, and installed on the condensate pan to prevent condensate from overflowing.

F. Electrical:

1. The indoor unit electrical power shall be 208-230 volts, 1-phase, 60 hertz.
2. The system shall be equipped with A-Control – a system directing that the indoor unit be powered directly from the outdoor unit using a 3-wire, 14 ga. AWG connection plus ground.
3. The indoor unit shall not have any supplemental electrical heat elements.

4. The outdoor unit shall be equipped with Pulse Amplitude Modulation (PAM) compressor motor control for maximum efficiency.

G. Control:

1. The unit shall have a wireless controller to perform input functions necessary to operate the system.
2. The wireless controller shall have a Power On/Off switch, Mode Selector – Cool, Dry, Heat, Auto Modes - Temperature Setting, Timer Control, Fan Speed Select and Auto Vane selector.
3. The indoor unit shall perform Self-diagnostic Function and Check Mode switching.
4. Temperature changes shall be by 1ºF increments with a range of 59 - 89ºF.
5. The microprocessor located in the indoor unit shall have the capability of sensing return air temperature and indoor coil temperature, receiving and processing commands from the wireless or a wired controller, providing emergency operation and controlling the outdoor unit.
6. The system shall be capable of automatically restarting and operating at the previously selected conditions when the power is restored after power interruption.
7. Control system shall control the continued operation of the air sweep louvers, as well as provide On/Off, System/Mode function.
8. The indoor unit shall have the option of either a wireless or wired wall mounted remote controller to be ordered separately:
   a. Wireless, wall mounted remote controller kit (MHK1)
      The Wireless, wall mounted remote controller kit (MHK1) shall consist of a wireless, wall mounted controller (MRCH1), a wireless receiver (MIFH1) and a cable (MRC1) to connect the receiver to the indoor unit. The controller shall be white in color with a light-green LCD display and a backlight feature. The MRCH1 shall consist of four Function buttons below the display, and Increase/Decrease Set Temperature buttons and a Hold button to the right of the display. The controller shall have a built-in temperature sensor and a battery holder, using two AA alkaline batteries. Temperature shall be displayed in either Fahrenheit (°F) or Celsius (°C), and temperature changes shall be by increments of 1°F (0.5°C).
      The MHK1 uses Honeywell RedLINK™ technology, and the wireless receiver is specially designed for Mitsubishi units. Linking to the wireless network shall be done from the receiver and from the remote controller. There shall not be any interference with other wireless devices or neighboring RedLINK™ products. Communication shall be automatically restored after power resumes and after batteries are replaced.
      The basic functions are:

Wireless, Wall Mounted Remote Controller Kit (MHK1)	
Item	**Description**
Number of Units Controllable	1 unit
ON/OFF	Run and stop operation
Operation Mode	Switches between Cool/Drying/Auto/Fan/Heat.

Wireless, Wall Mounted Remote Controller Kit (MHK1)	
Item	**Description**
Temperature Setting (Range and modes depend on connected unit model)	Controller general setpoint temperature range: Cool/Dry: 50°F-99°F Heat: 40°F-90°F Auto: 50°F-90°F Controller temperature range when connected to the MFZ/MXZ system: Cool/Dry: 61°F-88°F Heat: 61°F-88°F Auto: 61°F-88°F
Fan Speed Setting (Range and modes depend on connected unit model)	Hi/Mid-2/Mid-1/Low/Auto
Air Flow Direction Setting (Air flow direction settings depend on the unit model)	Air flow direction angles 100%-80%-60%-40%, Swing.
Dual Setpoint Control	Separate heating and cooling setpoints. Adjustable deadband from 2ºF to 8ºF. Automatically adjusts setpoints to ensure deadband. System changeover with dual setpoints.
Scheduling	5-2 and 5-1-1 schedules Separate Heat/Cool schedules Allows operation in AUTO with Scheduling setbacks and dual setpoint Simple temperature setting can be done up to 4 times per day in the week. The time can be set by the 15-minute interval. Remote controller shall be programmable as either a residential controller, which will offer residential scheduling options only; or as a commercial controller, which will offer commercial scheduling options only.
Optimal Start	Set occupied time and desired set temperature Remote controller learns when to start warm up or cool down so that space is at set temperature at start of occupied time
Operating Conditions Display	Setpoint and room temperature. Default sensing is at the remote controller. Installer setting to select at return air sensor. Automatically switches to return air sensor if communication to remote controller is lost Outdoor temperature and humidity (Requires optional air sensor MOS1)

Wireless, Wall Mounted Remote Controller Kit (MHK1)	
Item	**Description**
Additional Functions	Hold Function Temporary Schedule Override Reset to factory default
Error	When an error is currently occurring on an air conditioner unit, the afflicted unit and the error code are displayed
Auto Lock Out Function	Setting/releasing of simplified locking for remote control settings can be performed. • Locking of all settings • Locking of ON/OFF setting • Locking of system setting (Heat, Cool, Off, Auto, etc.) • Locking of fan setting • Locking of temperature setting • Locking of Clock/Day/Schedule

Two optional devices can be used with the MHK1 controller kit. These are, an outdoor air sensor (MOS1), which allows the display of the outdoor temperature and humidity, and a portable central controller (MCCH1), which can control up to 16 zones with On/Off, set temperature, heat/cool mode selection and auto-off timer.

b. Wired Remote Controller (PAR-21MAA)
The Wired Remote Controller PAR-21MAA shall require a MAC-397IF-E MA Series Terminal Interface for communications. Interface will be mounted at the indoor unit. A two (2) conductor, stranded, 22 AWG twisted pair, jacketed, cable shall connect the MAC-397IF-E to the PAR-21MAA wall controller. Connection shall not be polarity sensitive and controller wire shall not exceed thirty-three (33) feet (10m) length.
The wired remote controller shall be approximately 5” x 5” in size and white in color with a light-green LCD display. The PAR-21MAA shall support a selection from multiple languages (Spanish, German, Japanese, Chinese, English, Russian, Italian, or French) for display information. There shall be a built-in weekly timer with up to 8 pattern settings per day. The controller shall consist of an On/Off button, Increase/Decrease Set Temperature buttons, a Cool/Auto/Fan/Dry mode selector, a Timer Menu button, a Timer On/Off button, Set Time buttons, a Fan Speed selector, a Ventilation button, a Test Run button, and a Check Mode button. The controller shall have a built-in temperature sensor. Temperature shall be displayed in either Fahrenheit (°F) or Celsius (°C), and Temperature changes shall be by increments of 1°F (0.5°C). The PAR-21MAA shall have the capability of controlling up to a maximum of 16 systems, as a group with the same mode and set-point for all, at a maximum developed control cable distance of 1,500 feet (500 meters).
The basic functions are:

Wired Remote Controller (PAR-21MAA)	
Item	**Description**
Number of Units Controllable	16 units as 1 group
ON/OFF	Run and stop operation
Operation Mode	Switches between Cool/Dry/Auto/Fan/Heat.
Temperature Setting (Range and modes depend on connected unit model)	Sets the setpoint temperature in the following range Cool/Dry: 67°F-87°F Heat: 63°F-83°F Auto: 67°F-83°F
Fan Speed Setting (Range and modes depend on connected unit model)	Hi/Mid-2/Mid-1/Low/Auto
Air Flow Direction Setting (Air flow direction settings depend on the unit model)	Air flow direction angles 100%-80%-60%-40%, Swing.
Weekly Scheduler	ON/OFF/Temperature setting can be done up to 8 times one day in the week. The time can be set by the 1-minute interval.
Operating Conditions Display	Setpoint and room temperature. Sensing can be done at the remote controller or the indoor unit depending on the indoor unit dipswitch setting Liquid, discharge, indoor and outdoor pipe temperatures LEV opening pulses, sub cooling and discharge super heat Compressor Operating Conditions: Running current, frequency, input voltage, On/Off status and operating time
Error	When an error is currently occurring on an air conditioner unit, the afflicted unit and the error code are displayed
Ventilation Equipment	Up to 16 indoor units can be connected to an interlocked system that has one LOSSNAY unit. LOSSNAY items that can be set are “Hi”, “Low”, and “Stop”. Ventilation mode switching is not available.
Auto Lock Out Function	Setting/releasing of simplified locking for remote control buttons can be performed. • Locking of all buttons • Locking of all buttons except ON/OFF button

4.04. Ceiling Suspended PCA-A24KA4 Indoor Unit:

A. General:
The indoor unit shall be fully factory assembled, wired and run tested prior to shipment. Contained within the indoor unit shall be all factory wiring, piping, control circuit board, fan, and fan motor. The unit shall have a self-diagnostic function, 3-minute restart time delay mechanism, an auto restart function, an emergency / test operation. Indoor unit shall be charged with dry air before shipment from factory.

B. Unit Cabinet:
1. The casing shall have a white finish– Munsell 6.4Y 8.9/0.4.
2. Cabinet shall be designed for suspension mounting from above and horizontal operation. Indoor unit shall have removable mounting brackets. A mounting template with suspension bolt locations shall be furnished with indoor unit. Mounting bolts or threaded rod of 3/8" diameter shall be used to suspend unit and unit shall not require direct contact with ceiling or panel for proper operation. Mounting support shall be of sufficient strength and design to support full weight of indoor unit. The rear cabinet panel shall have knock-out provisions for a field installed filtered 4-5/16 diameter ventilation air intake connection.

C. Fan:
1. The indoor unit fan shall have multiple high performance, double inlet, forward curve sirocco fans driven by a single motor.
2. The fan shall be statically and dynamically balanced and run on a motor with permanently lubricated bearing.
3. There shall be a motorized horizontal vane to automatically direct air flow in a horizontal and downward direction for uniform air distribution. The horizontal vane shall provide a choice of five (5) vertical airflow patterns selected by remote control: 100% horizontal flow, 80% horizontal flow (plus 20% downward airflow), 60% horizontal airflow (plus 40% downward airflow), 40% horizontal airflow (plus 60% downward airflow), and swing. The horizontal vane shall significantly decrease downward air resistance for lower sound levels, and shall close the outlet port when operation is stopped.
4. There shall also be a set of vertical vanes to provide horizontal swing airflow movement selected by remote control.
5. The indoor fan shall operate at one of five (4) speeds: Hi, M2, M1 and Low plus Auto Fan Mode that will adjust the fan speed based on the difference between controller set-point and sensed space temperature.
6. Indoor unit sound level shall not exceed:

Model / Speed	Hi	M2	M1	Low
PCA-A24KA4	40 dB(A)	37 dB(A)	35 dB(A)	33 dB(A)

D. Filter:
1. Return air shall be filtered by means of an easily removable, washable filter. [*An optional MERV 8 filter shall be furnished*].

E. Coil:

1. The indoor unit coil shall be of nonferrous construction with pre-coated aluminum strake fins on copper tubing.
2. The multi-angled heat exchanger shall have a modified fin shape that reduces air resistance for a smoother, quieter airflow.
3. All tube joints shall be brazed with PhosCopper or silver alloy.
4. The coils shall be pressure tested at the factory.
5. A sloped, corrosion resistant condensate pan with drain shall be provided under the coil. An optional drain pan level switch (DPLS1), designed to connect to the control board, shall be provided if required, and installed on the condensate pan to prevent condensate from overflowing. [*An optional drain lift mechanism, capable of lifting condensate 23-5/8"(600mm) above the drain pan, shall be provided*]

F. Electrical:
1. The indoor unit electrical power shall be 208 / 230 volts, 1-phase, 60 hertz.
2. The system shall be capable of satisfactory operation within voltage limits of 187 volts to 253 volts.
3. The system shall be equipped with A-Control – a system allowing each indoor unit to be powered and controlled directly from the outdoor unit using a 14 gauge (AWG) 3-wire connection plus ground providing both primary power and integrated, by-directional, digital control signal without additional connections.

G. Control:
1. The control system shall consist of a minimum of one microprocessor on each indoor unit and one on the outdoor unit, interconnected by single non-polar two-wire cables. The microprocessor located in the indoor unit shall have the capability of monitoring return air temperature and indoor coil temperature, receiving and processing commands from a wireless or wired controller, providing emergency operation and controlling the outdoor unit. The control signal between the indoor and outdoor unit shall be pulse signal 24 volts DC. Indoor units shall have the ability to control supplemental heat via connector CN24 and a 12 VDC output.
2. For A-Control, a three (3) conductor 14 gauge AWG wire with ground shall provide power feed and bi-directional control transmission between the outdoor and indoor units. . If code requires a disconnect mounted near the indoor unit, a TAZ-MS303 3-Pole Disconnect shall be used – all three conductors must be interrupted.
3. The system shall be capable of automatic restart when power is restored after power interruption. The system shall have self-diagnostics ability, including total hours of compressor run time. Diagnostics codes for indoor and outdoor units shall be displayed on the wired controller panel.
4. Remote Controllers
   All remote controllers need to be ordered separately from the unit.

   a. Wireless, wall mounted remote controller kit (MHK1)
      The Wireless, wall mounted remote controller kit (MHK1) shall consist of a wireless, wall mounted controller (MRCH1), a wireless receiver (MIFH1) and a cable (MRC1) to connect the receiver to the indoor unit. The controller shall be white in color with a light-green LCD display and a backlight feature. The MRCH1 shall consist of four Function buttons below the display, and Increase/Decrease Set Temperature buttons and a Hold button to the right of the display. The controller

shall have a built-in temperature sensor and a battery holder, using two AA alkaline batteries. Temperature shall be displayed in either Fahrenheit (°F) or Celsius (°C), and temperature changes shall be by increments of 1°F (0.5°C).
The MHK1 uses Honeywell RedLINK™ technology, and the wireless receiver is specially designed for Mitsubishi units. Linking to the wireless network shall be done from the receiver and from the remote controller. There shall not be any interference with other wireless devices or neighboring RedLINK™ products. Communication shall be automatically restored after power resumes and after batteries are replaced.
The basic functions are:

Wireless, Wall Mounted Remote Controller Kit (MHK1)	
Item	**Description**
Number of Units Controllable	1 unit
ON/OFF	Run and stop operation
Operation Mode	Switches between Cool/Drying/Auto/Fan/Heat.
Temperature Setting (Range and modes depend on connected unit model)	Controller general setpoint temperature range: Cool/Dry: 50°F-99°F Heat: 40°F-90°F Auto: 50°F-90°F Controller temperature range when connected to the PCA/MXZ system: Cool/Dry: 67°F-87°F Heat: 63°F-83°F Auto: 67°F-83°F
Fan Speed Setting (Range and modes depend on connected unit model)	Hi/Mid-2/Mid-1/Low/Auto
Air Flow Direction Setting (Air flow direction settings depend on the unit model)	Air flow direction angles 100%-80%-60%-40%, Swing.
Dual Setpoint Control	Separate heating and cooling setpoints. Adjustable deadband from 2ºF to 8ºF. Automatically adjusts setpoints to ensure deadband. System changeover with dual setpoints.

Wireless, Wall Mounted Remote Controller Kit (MHK1)	
Item	**Description**
Scheduling	5-2 and 5-1-1 schedules Separate Heat/Cool schedules Allows operation in AUTO with Scheduling setbacks and dual setpoint Simple temperature setting can be done up to 4 times one day in the week. The time can be set by the 15-minute interval. Remote controller shall be programmable as either a residential controller, which will offer residential scheduling options only; or as a commercial controller, which will offer commercial scheduling options only.
Optimal Start	Set occupied time and desired set temperature Remote controller learns when to start warm up or cool down so that space is at set temperature at start of occupied time
Operating Conditions Display	Setpoint and room temperature. Default sensing is at the remote controller. Installer setting to select at return air sensor. Automatically switches to return air sensor if communication to remote controller is lost Outdoor temperature and humidity (Requires optional air sensor MOS1)
Additional Functions	Hold Function Temporary Schedule Override Reset to factory default
Error	When an error is currently occurring on an air conditioner unit, the afflicted unit and the error code are displayed
Auto Lock Out Function	Setting/releasing of simplified locking for remote control settings can be performed. • Locking of all settings • Locking of ON/OFF setting • Locking of system setting (Heat, Cool, Off, Auto, etc.) • Locking of fan setting • Locking of temperature setting • Locking of Clock/Day/Schedule

Two optional devices can be used with the MHK1 controller kit. These are, an outdoor air sensor (MOS1), which allows the display of the outdoor temperature and humidity, and a portable central controller (MCCH1), which can control up to 16 zones with On/Off, set temperature, heat/cool mode selection and auto-off timer.

b. Wired Remote Controller (PAR-21MAA)

The Wired Remote Controller (PAR-21MAA) shall be approximately 5” x 5” in size and white in color with a light-green LCD display. The PAR-21MAA shall support a selection from multiple languages (Spanish, German, Japanese, Chinese, English, Russian, Italian, or French) for display information. There shall be a built-in weekly timer with up to 8 pattern settings per day. The controller shall consist of an On/Off button, Increase/Decrease Set Temperature buttons, a Cool/Auto/Fan/Dry mode selector, a Timer Menu button, a Timer On/Off button, Set Time buttons, a Fan Speed selector, a Ventilation button, a Test Run button, and a Check Mode button. The controller shall have a built-in temperature sensor. Temperature shall be displayed in either Fahrenheit (°F) or Celsius (°C), and Temperature changes shall be by increments of 1°F (0.5°C). The PAR-21MAA shall have the capability of controlling up to a maximum of 16 systems, as a group with the same mode and set-point for all, at a maximum developed control cable distance of 1,500 feet (500 meters).

The control voltage from the wired controller to the indoor unit shall be 12/24 volts, DC. Field wiring shall run directly from the indoor unit to the wall mounted controller with no splices. Up to two wired controllers shall be able to be used to control one unit.

The basic functions are:

Wired Remote Controller (PAR-21MAA)	
Item	**Description**
Number of Units Controllable	16 units as 1 group
ON/OFF	Run and stop operation
Operation Mode	Switches between Cool/Dry/Auto/Fan/Heat.
Temperature Setting (Range and modes depend on connected unit model)	Sets the setpoint temperature in the following range Cool/Dry: 67°F-87°F Heat: 63°F-83°F Auto: 67°F-83°F
Fan Speed Setting (Range and modes depend on connected unit model)	Hi/Mid-2/Mid-1/Low/Auto
Air Flow Direction Setting (Air flow direction settings depend on the unit model)	Air flow direction angles 100%-80%-60%-40%, Swing.
Weekly Scheduler	ON/OFF/Temperature setting can be done up to 8 times one day in the week. The time can be set by the 1-minute interval.

Wired Remote Controller (PAR-21MAA)	
Item	**Description**
Operating Conditions Display	Setpoint and room temperature. Sensing can be done at the remote controller or the indoor unit depending on the indoor unit dipswitch setting Liquid, discharge, indoor and outdoor pipe temperatures LEV opening pulses, sub cooling and discharge super heat Compressor Operating Conditions: Running current, frequency, input voltage, On/Off status and operating time
Error	When an error is currently occurring on an air conditioner unit, the afflicted unit and the error code are displayed
Ventilation Equipment	Up to 16 indoor units can be connected to an interlocked system that has one LOSSNAY unit. LOSSNAY items that can be set are “Hi”, “Low”, and “Stop”. Ventilation mode switching is not available.
Auto Lock Out Function	Setting/releasing of simplified locking for remote control buttons can be performed. • Locking of all buttons • Locking of all buttons except ON/OFF button

c. Wireless Remote Controller Kit (PAR-SL93B-E)
The Wireless Remote Controller Kit (PAR-SL93B-E) shall consist of a hand held wireless remote controller and a wireless receiver. The controller shall perform input functions necessary to operate the system. The wireless receiver shall be plug and fit compatible with the indoor unit.
The controller shall have a Power On/Off switch, Mode Selector – Cool, Dry, Heat, Auto, and Powerful Modes - Temperature Setting, Timer Control, Fan Speed Select and Horizontal and Vertical Vane control selector. There shall be an i-See® Sensor Area Selector control. The indoor unit shall perform Self-diagnostic Function and Check Mode switching. Temperature changes shall be in 1ºF (0.5ºC) increments with a setting range of 61 to 88ºF (16 to 31ºC).

5. The microprocessor located in the indoor unit shall have the capability of sensing return air temperature and indoor coil temperature, receiving and processing commands from the wireless or a wired controller, providing emergency operation and controlling the outdoor unit.
6. Indoor units shall be equipped with an optional “i-see® Sensor” kit, providing i-See® Sensor technology providing uniform temperature detection and automatically response to adjust the set temperature to provide uniform comfort from floor to ceiling.

4.05. Ceiling Recessed SLZ-KA**NA Indoor Units.

A. General:

The SLZ shall be a four-way cassette style indoor unit that recesses into the ceiling with a ceiling grille. The indoor unit shall be factory assembled, wired and run tested. Contained within the unit shall be all factory wiring, piping, electronic modulating linear expansion device, control circuit board and fan motor. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, an auto restart function, an emergency operation function and a test run switch. Indoor unit and refrigerant pipes shall be charged with dehydrated air before shipment from the factory.

B. Unit Cabinet:

1. The cabinet shall be a compact 22-7/16" wide x 22-7/16" deep so it will fit within a standard 24" square suspended ceiling grid.
2. The cabinet panel shall have provisions for a field installed filtered outside air intake.
3. Four-way grille shall be fixed to bottom of cabinet allowing two, three or four-way blow.

C. Fan:

1. The indoor fan shall be an assembly with a turbo fan direct driven by a single motor.
2. The indoor fan shall be statically and dynamically balanced to run on a motor with permanently lubricated bearings.
3. The indoor fan shall consist of three (3) speeds, Low, Mid, and High.
4. The indoor unit shall have an adjustable air outlet system offering 4-way airflow, 3-way airflow, or 2-way airflow.
5. The auto air swing vanes shall be capable of automatically swinging up and down for uniform air distribution.

D. Filter:

1. Return air shall be filtered by means of a long-life washable filter.

E. Coil:

1. The indoor coil shall be of nonferrous construction with smooth plate fins on copper tubing.
2. The tubing shall have inner grooves for high efficiency heat exchange.
3. All tube joints shall be brazed with phos-copper or silver alloy.
4. The coils shall be pressure tested at the factory.
5. A condensate pan and drain shall be provided under the coil.
6. The unit shall include a condensate lift mechanism that will be able to raise drain water 19-3/4" inches above the condensate pan.
7. An optional drain pan level switch (DPLS1), designed to connect to the control board, shall be provided if required, and installed on the condensate pan to prevent condensate from overflowing.
8. Both refrigerant lines to the SLZ indoor units shall be insulated.

F. Electrical:

1. The unit electrical power shall be 208/230 volts, 1-phase, 60 hertz.
2. The system shall be capable of satisfactory operation within voltage limits of 187-228 volts (208V/60Hz) or 207-253 volts (230V/60Hz).

G. Controls:

1. The control system shall consist of a minimum of one microprocessor on each indoor unit and one on the outdoor unit, interconnected by single non-polar two-wire cables. The microprocessor located in the indoor unit shall have the capability of monitoring return air temperature and indoor coil temperature, receiving and processing commands from a wireless or wired controller, providing emergency operation and controlling the

outdoor unit. The control signal between the indoor and outdoor unit shall be pulse signal 24 volts DC. Indoor units shall have the ability to control supplemental heat via connector CN24 and a 12 VDC output.

2. For A-Control, a three (3) conductor 14 gauge AWG wire with ground shall provide power feed and bi-directional control transmission between the outdoor and indoor units. . If code requires a disconnect mounted near the indoor unit, a TAZ-MS303 3-Pole Disconnect shall be used – all three conductors must be interrupted.
3. The system shall be capable of automatic restart when power is restored after power interruption. The system shall have self-diagnostics ability, including total hours of compressor run time. Diagnostics codes for indoor and outdoor units shall be displayed on the wired controller panel.
4. Remote Controller
   All remote controller needs to be ordered separately from the unit.
   a. Wireless, wall mounted remote controller kit (MHK1)
      The Wireless, wall mounted remote controller kit (MHK1) shall consist of a wireless, wall mounted controller (MRCH1), a wireless receiver (MIFH1) and a cable (MRC1) to connect the receiver to the indoor unit. The controller shall be white in color with a light-green LCD display and a backlight feature. The MRCH1 shall consist of four Function buttons below the display, and Increase/Decrease Set Temperature buttons and a Hold button to the right of the display. The controller shall have a built-in temperature sensor and a battery holder, using two AA alkaline batteries. Temperature shall be displayed in either Fahrenheit (°F) or Celsius (°C), and temperature changes shall be by increments of 1°F (0.5°C).
      The MHK1 uses Honeywell RedLINK™ technology, and the wireless receiver is specially designed for Mitsubishi units. Linking to the wireless network shall be done from the receiver and from the remote controller. There shall not be any interference with other wireless devices or neighboring RedLINK™ products. Communication shall be automatically restored after power resumes and after batteries are replaced.
      The basic functions are:

Wireless, Wall Mounted Remote Controller Kit (MHK1)	
Item	**Description**
Number of Units Controllable	1 unit
ON/OFF	Run and stop operation
Operation Mode	Switches between Cool/Drying/Auto/Fan/Heat.
Temperature Setting (Range and modes depend on connected unit model)	Controller general setpoint temperature range: Cool/Dry: 50°F-99°F Heat: 40°F-90°F Auto: 50°F-90°F Controller temperature range when connected to the SLZ/SUZ system: Cool/Dry: 67°F-87°F Heat: 63°F-83°F Auto: 67°F-83°F

Wireless, Wall Mounted Remote Controller Kit (MHK1)	
Item	**Description**
Fan Speed Setting (Range and modes depend on connected unit model)	Hi/Mid-2/Mid-1/Low/Auto
Air Flow Direction Setting (Air flow direction settings depend on the unit model)	Air flow direction angles 100%-80%-60%-40%, Swing.
Dual Setpoint Control	Separate heating and cooling setpoints. Adjustable deadband from 2ºF to 8ºF. Automatically adjusts setpoints to ensure deadband. System changeover with dual setpoints.
Scheduling	5-2 and 5-1-1 schedules Separate Heat/Cool schedules Allows operation in AUTO with Scheduling setbacks and dual setpoint Simple temperature setting can be done up to 4 times one day in the week. The time can be set by the 15-minute interval. Remote controller shall be programmable as either a residential controller, which will offer residential scheduling options only; or as a commercial controller, which will offer commercial scheduling options only.
Optimal Start	Set occupied time and desired set temperature Remote controller learns when to start warm up or cool down so that space is at set temperature at start of occupied time
Operating Conditions Display	Setpoint and room temperature. Default sensing is at the remote controller. Installer setting to select at return air sensor. Automatically switches to return air sensor if communication to remote controller is lost Outdoor temperature and humidity (Requires optional air sensor MOS1)
Additional Functions	Hold Function Temporary Schedule Override Reset to factory default
Error	When an error is currently occurring on an air conditioner unit, the afflicted unit and the error code are displayed

Wireless, Wall Mounted Remote Controller Kit (MHK1)	
Item	**Description**
Auto Lock Out Function	Setting/releasing of simplified locking for remote control settings can be performed. • Locking of all settings • Locking of ON/OFF setting • Locking of system setting (Heat, Cool, Off, Auto, etc.) • Locking of fan setting • Locking of temperature setting • Locking of Clock/Day/Schedule

Two optional devices can be used with the MHK1 controller kit. These are, an outdoor air sensor (MOS1), which allows the display of the outdoor temperature and humidity, and a portable central controller (MCCH1), which can control up to 16 zones with On/Off, set temperature, heat/cool mode selection and auto-off timer.

b. Wired Remote Controller (PAR-21MAA)
The Wired Remote Controller (PAR-21MAA) shall be approximately 5" x 5" in size and white in color with a light-green LCD display. The PAR-21MAA shall support a selection from multiple languages (Spanish, German, Japanese, Chinese, English, Russian, Italian, or French) for display information. There shall be a built-in weekly timer with up to 8 pattern settings per day. The controller shall consist of an On/Off button, Increase/Decrease Set Temperature buttons, a Cool/Auto/Fan/Dry mode selector, a Timer Menu button, a Timer On/Off button, Set Time buttons, a Fan Speed selector, a Ventilation button, a Test Run button, and a Check Mode button. The controller shall have a built-in temperature sensor. Temperature shall be displayed in either Fahrenheit (°F) or Celsius (°C), and Temperature changes shall be by increments of 1°F (0.5°C). The PAR-21MAA shall have the capability of controlling up to a maximum of 16 systems, as a group with the same mode and set-point for all, at a maximum developed control cable distance of 1,500 feet (500 meters).
Field wiring shall run directly from the indoor unit to the wired controller with no splices. The control voltage from the wired controller to the indoor unit shall be 12/24 volts, DC. Up to two wired controllers shall be able to be used to control one unit.
The basic functions are:

Wired Remote Controller (PAR-21MAA)	
Item	**Description**
Number of Units Controllable	16 units as 1 group
ON/OFF	Run and stop operation
Operation Mode	Switches between Cool/Dry/Auto/Fan/Heat.

Wired Remote Controller (PAR-21MAA)	
Item	**Description**
Temperature Setting (Range and modes depend on connected unit model)	Sets the setpoint temperature in the following range Cool/Dry: 67°F-87°F Heat: 63°F-83°F Auto: 67°F-83°F
Fan Speed Setting (Range and modes depend on connected unit model)	Hi/Mid-2/Mid-1/Low/Auto
Air Flow Direction Setting (Air flow direction settings depend on the unit model)	Air flow direction angles 100%-80%-60%-40%, Swing.
Weekly Scheduler	ON/OFF/Temperature setting can be done up to 8 times one day in the week. The time can be set by the 1-minute interval.
Operating Conditions Display	Setpoint and room temperature. Sensing can be done at the remote controller or the indoor unit depending on the indoor unit dipswitch setting Liquid, discharge, indoor and outdoor pipe temperatures LEV opening pulses, sub cooling and discharge super heat Compressor Operating Conditions: Running current, frequency, input voltage, On/Off status and operating time
Error	When an error is currently occurring on an air conditioner unit, the afflicted unit and the error code are displayed
Ventilation Equipment	Up to 16 indoor units can be connected to an interlocked system that has one LOSSNAY unit. LOSSNAY items that can be set are “Hi”, “Low”, and “Stop”. Ventilation mode switching is not available.
Auto Lock Out Function	Setting/releasing of simplified locking for remote control buttons can be performed. • Locking of all buttons • Locking of all buttons except ON/OFF button

c. Wireless, hand held remote controller (PAR-FL32MA)
The wireless had held remote controller (PAR-FL32MA) shall be used with a wireless receiver (PAR-FA32MA-E). The controller shall perform input functions necessary to operate the system. The wireless receiver shall be plug and fit compatible with the indoor unit.
The controller shall have a Power On/Off switch, Mode Selector – Cool, Dry, Heat, Auto, and Powerful Modes - Temperature Setting, Timer Control and Fan Speed Selector. The indoor unit shall perform Self-diagnostic Function and Check Mode

switching. Temperature changes shall be in 1ºF (0.5ºC) increments with a setting range of 61 to 88ºF (16 to 31ºC).

5. The microprocessor located in the indoor unit shall have the capability of sensing return air temperature and indoor coil temperature, receiving and processing commands from the wireless or a wired controller, providing emergency operation and controlling the outdoor unit.
6. Indoor units shall be equipped with an optional "i-see® Sensor" kit, providing i-See® Sensor technology providing uniform temperature detection and automatically response to adjust the set temperature to provide uniform comfort from floor to ceiling.

4.06. Ceiling Recessed PLA-A**BA4 Indoor Unit:

A. General:
The indoor unit shall be a space-saving ceiling-recessed cassette type, factory assembled, wired and run tested prior to shipment. Contained within the indoor unit shall be all factory wiring, piping, control circuit board, fan, and fan motor. The unit , in conjunction with the remote controller (wired wall mounted controller or wireless handheld controller and receiver kit, ordered separately) shall have a self-diagnostic function, 3-minute restart time delay mechanism, an auto restart function, an emergency / test operation. Indoor unit shall be charged with dry air before shipment from factory.

B. Unit Cabinet:

1. The cabinet shall be formed from galvanized sheet metal coated with high-density foam insulation. Cabinet shall be for recessed mounting and provided with four (4) corner mounting supports behind removable corner pockets in Grille assembly allowing adjustment of mounting height from front of unit.
2. The cabinet panel shall have provisions for a field installed filtered outside air intake.
3. There shall be a knock-out to provide a branch air duct for conditioning a secondary space.
4. There shall be an optional multi-function casement which will mount between the unit cabinet and the Grille assembly to provide a second field installed filtered outside air intake and provide a mount for a high-efficiency filter element.
5. A separate grill assembly shall be attached to the front of the cabinet to provide supply air vanes in four directions and a center mounted return air section. The four-way grill shall be fixed to bottom of cabinet allowing two, three or four-way blow. The grill vane angles shall be individually adjustable from the wired remote controller to customize the airflow pattern for the conditioned space. Grill assembly color shall be white, Munsell number 6.4Y 8.9/0.4.

C. Fan:
1. The indoor fan shall be an assembly with a turbo fan propeller, direct driven by a single motor and shall be statically and dynamically balanced to run on a motor with permanently lubricated bearings.
2. The indoor unit shall have an adjustable air outlet system offering 4-way airflow, 3-way airflow, or 2-way airflow with switches that can be set to provide optimum airflow based on ceiling height and number of outlets used.

3. The indoor unit vanes shall have 5 fixed positions and a swing feature that shall be capable of automatically swinging the vanes up and down for uniform air distribution.
4. The vanes shall have an Auto-Wave selectable option in the heating mode that shall randomly cycle the vanes up and down to evenly heat the space. If specified, the grill shall have an optional i-see® sensor kit installed – sensor function described in System Control Section.
5. The indoor fan shall consist of four (4) speed settings, Low, Mid1, Mid2, High and Auto. The fan shall have a selectable Auto fan setting that will adjust the fan speed based on the difference between controller set-point and space temperature.
   Indoor unit sound level shall not exceed the levels below:

Model Number	Low Speed	Mid Speed 1	Mid Speed 2	High Speed
PLA-A18BA4	28 dB(A)	29 dB(A)	31 dB(A)	32 dB(A)
PLA-A24BA4	28 dB(A)	29 dB(A)	31 dB(A)	32 dB(A)
PLA-A30BA4	28 dB(A)	30 dB(A)	32 dB(A)	34 dB(A)
PLA-A36BA4	32 dB(A)	34 dB(A)	37 dB(A)	40 dB(A)
PLA-A42BA4	34 dB(A)	36 dB(A)	39 dB(A)	41 dB(A)

D. Filter:
1. Return air shall be filtered by means of an easily removable, long life, washable filter. [*An optional high-efficiency filter shall be installed in the multi-function casement*].

E. Coil:
1. The indoor unit coil shall be of nonferrous construction with pre-coated aluminum strake fins on copper tubing. The tubing shall have inner grooves for high efficiency heat exchange.
2. The heat exchanger shall have a modified fin shape that reduces air resistance for a smoother, quieter airflow. All tube joints shall be brazed with PhosCopper or silver alloy. The coils shall be pressure tested at the factory.
3. A condensate pan with drain connections shall be provided under the coil. The unit shall also include a built-in, automatic condensate lift mechanism that will be able to raise drain water 33 inches (84 cm) above the condensate pan. The lift mechanism shall be equipped with a positive acting liquid level sensor to shut down the indoor unit if liquid level in the drain pan reached maximum level. An optional secondary drain pan level switch (DPLS1), designed to connect to the control board, shall also be provided if required, and installed on the condensate pan.
4. Both refrigerant lines between the indoor unit and outdoor unit shall be fully insulated.

F. Electrical:
1. The indoor unit electrical power shall be 208 / 230 volts, 1-phase, 60 hertz.
2. The system shall be capable of satisfactory operation within voltage limits of 187 volts to 253 volts.
3. The system shall be equipped with A-Control – a system allowing each indoor unit to be powered and controlled directly from the outdoor unit using a 14 gauge (AWG) 3-wire connection plus ground providing both primary power and integrated, bi-directional, digital control signal without additional connections.
4. The indoor unit shall not have any supplemental or back-up heating elements.

G. Control:

1. The control system shall consist of a minimum of one microprocessor on each indoor unit and one on the outdoor unit, interconnected by single non-polar two-wire cables. The microprocessor located in the indoor unit shall have the capability of monitoring return air temperature and indoor coil temperature, receiving and processing commands from a wireless or wired controller, providing emergency operation and controlling the outdoor unit. The control signal between the indoor and outdoor unit shall be pulse signal 24 volts DC. Indoor units shall have the ability to control supplemental heat via connector CN24 and a 12 VDC output.
2. For A-Control, a three (3) conductor 14 ga. AWG wire with ground shall provide power feed and bi-directional control transmission between the outdoor and indoor units. . If code requires a disconnect mounted near the indoor unit, a TAZ-MS303 3-Pole Disconnect shall be used – all three conductors must be interrupted.
3. The system shall be capable of automatic restart when power is restored after power interruption. The system shall have self-diagnostics ability, including total hours of compressor run time. Diagnostics codes for indoor and outdoor units shall be displayed on the wired controller panel.
4. Remote Controllers
   All remote controllers need to be ordered separately from the unit.

   a. Wireless, wall mounted remote controller kit (MHK1)
      The Wireless, wall mounted remote controller kit (MHK1) shall consist of a wireless, wall mounted controller (MRCH1), a wireless receiver (MIFH1) and a cable (MRC1) to connect the receiver to the indoor unit. The controller shall be white in color with a light-green LCD display and a backlight feature. The MRCH1 shall consist of four Function buttons below the display, and Increase/Decrease Set Temperature buttons and a Hold button to the right of the display. The controller shall have a built-in temperature sensor and a battery holder, using two AA alkaline batteries. Temperature shall be displayed in either Fahrenheit (°F) or Celsius (°C), and temperature changes shall be by increments of 1°F (0.5°C).
      The MHK1 uses Honeywell RedLINK™ technology, and the wireless receiver is specially designed for Mitsubishi units. Linking to the wireless network shall be done from the receiver and from the remote controller. There shall not be any interference with other wireless devices or neighboring RedLINK™ products. Communication shall be automatically restored after power resumes and after batteries are replaced.
      The basic functions are:

Wireless, Wall Mounted Remote Controller Kit (MHK1)	
Item	**Description**
Number of Units Controllable	1 unit
ON/OFF	Run and stop operation
Operation Mode	Switches between Cool/Drying/Auto/Fan/Heat.

Wireless, Wall Mounted Remote Controller Kit (MHK1)	
Item	**Description**
Temperature Setting (Range and modes depend on connected unit model)	Controller general setpoint temperature range: Cool/Dry: 50°F-99°F Heat: 40°F-90°F Auto: 50°F-90°F Controller temperature range when connected to the PLA/MXZ system: Cool/Dry: 67°F-87°F Heat: 63°F-83°F Auto: 67°F-83°F
Fan Speed Setting (Range and modes depend on connected unit model)	Hi/Mid-2/Mid-1/Low/Auto
Air Flow Direction Setting (Air flow direction settings depend on the unit model)	Air flow direction angles 100%-80%-60%-40%, Swing.
Dual Setpoint Control	Separate heating and cooling setpoints. Adjustable deadband from 2ºF to 8ºF. Automatically adjusts setpoints to ensure deadband. System changeover with dual setpoints.
Scheduling	5-2 and 5-1-1 schedules Separate Heat/Cool schedules Allows operation in AUTO with Scheduling setbacks and dual setpoint Simple temperature setting can be done up to 4 times one day in the week. The time can be set by the 15-minute interval. Remote controller shall be programmable as either a residential controller, which will offer residential scheduling options only; or as a commercial controller, which will offer commercial scheduling options only.
Optimal Start	Set occupied time and desired set temperature Remote controller learns when to start warm up or cool down so that space is at set temperature at start of occupied time
Operating Conditions Display	Setpoint and room temperature. Default sensing is at the remote controller. Installer setting to select at return air sensor. Automatically switches to return air sensor if communication to remote controller is lost Outdoor temperature and humidity (Requires optional air sensor MOS1)

Wireless, Wall Mounted Remote Controller Kit (MHK1)	
Item	**Description**
Additional Functions	Hold Function Temporary Schedule Override Reset to factory default
Error	When an error is currently occurring on an air conditioner unit, the afflicted unit and the error code are displayed
Auto Lock Out Function	Setting/releasing of simplified locking for remote control settings can be performed. • Locking of all settings • Locking of ON/OFF setting • Locking of system setting (Heat, Cool, Off, Auto, etc.) • Locking of fan setting • Locking of temperature setting • Locking of Clock/Day/Schedule

Two optional devices can be used with the MHK1 controller kit. These are, an outdoor air sensor (MOS1), which allows the display of the outdoor temperature and humidity, and a portable central controller (MCCH1), which can control up to 16 zones with On/Off, set temperature, heat/cool mode selection and auto-off timer.

b. Wired Remote Controller (PAR-21MAA)
The Wired Remote Controller (PAR-21MAA) shall be approximately 5” x 5” in size and white in color with a light-green LCD display. The PAR-21MAA shall support a selection from multiple languages (Spanish, German, Japanese, Chinese, English, Russian, Italian, or French) for display information. There shall be a built-in weekly timer with up to 8 pattern settings per day. The controller shall consist of an On/Off button, Increase/Decrease Set Temperature buttons, a Cool/Auto/Fan/Dry mode selector, a Timer Menu button, a Timer On/Off button, Set Time buttons, a Fan Speed selector, a Ventilation button, a Test Run button, and a Check Mode button. The controller shall have a built-in temperature sensor. Temperature shall be displayed in either Fahrenheit (°F) or Celsius (°C), and Temperature changes shall be by increments of 1°F (0.5°C). The PAR-21MAA shall have the capability of controlling up to a maximum of 16 systems, as a group with the same mode and set-point for all, at a maximum developed control cable distance of 1,500 feet (500 meters).
The control voltage from the wired controller to the indoor unit shall be 12/24 volts, DC. Field wiring shall run directly from the indoor unit to the wall mounted controller with no splices. Up to two wired controllers shall be able to be used to control one unit.
The basic functions are:

Wired Remote Controller (PAR-21MAA)	
Item	**Description**
Number of Units Controllable	16 units as 1 group
ON/OFF	Run and stop operation
Operation Mode	Switches between Cool/Dry/Auto/Fan/Heat.
Temperature Setting (Range and modes depend on connected unit model)	Sets the setpoint temperature in the following range Cool/Dry: 67°F-87°F Heat: 63°F-83°F Auto: 67°F-83°F
Fan Speed Setting (Range and modes depend on connected unit model)	Hi/Mid-2/Mid-1/Low/Auto
Air Flow Direction Setting (Air flow direction settings depend on the unit model)	Air flow direction angles 100%-80%-60%-40%, Swing.
Weekly Scheduler	ON/OFF/Temperature setting can be done up to 8 times one day in the week. The time can be set by the 1-minute interval.
Operating Conditions Display	Setpoint and room temperature. Sensing can be done at the remote controller or the indoor unit depending on the indoor unit dipswitch setting Liquid, discharge, indoor and outdoor pipe temperatures LEV opening pulses, sub cooling and discharge super heat Compressor Operating Conditions: Running current, frequency, input voltage, On/Off status and operating time
Error	When an error is currently occurring on an air conditioner unit, the afflicted unit and the error code are displayed
Ventilation Equipment	Up to 16 indoor units can be connected to an interlocked system that has one LOSSNAY unit. LOSSNAY items that can be set are “Hi”, “Low”, and “Stop”. Ventilation mode switching is not available.
Auto Lock Out Function	Setting/releasing of simplified locking for remote control buttons can be performed. • Locking of all buttons • Locking of all buttons except ON/OFF button

c. Wireless Remote Controller Kit (PAR-FL32MA)
The wireless had held remote controller (PAR-FL32MA) shall be used with a wireless receiver (PAR-SA9FA-E). The controller shall perform input functions

necessary to operate the system. The wireless receiver shall be plug and fit compatible with the indoor unit.
The controller shall have a Power On/Off switch, Mode Selector – Cool, Dry, Heat, Auto, and Powerful Modes - Temperature Setting, Timer Control, Fan Speed Select and Horizontal and Vertical Vane control selector. There shall be an i-See® Sensor Area Selector control. The indoor unit shall perform Self-diagnostic Function and Check Mode switching. Temperature changes shall be in 1ºF (0.5ºC) increments with a setting range of 61 to 88ºF (16 to 31ºC).

5. The microprocessor located in the indoor unit shall have the capability of sensing return air temperature and indoor coil temperature, receiving and processing commands from the wireless or a wired controller, providing emergency operation and controlling the outdoor unit.
6. Indoor units shall be equipped with an optional "i-see® Sensor" kit, providing i-See® Sensor technology providing uniform temperature detection and automatically response to adjust the set temperature to provide uniform comfort from floor to ceiling.

4.07. Horizontal Ducted SEZ-KD**NA4 Indoor Units:

A. General:
The indoor unit shall be factory assembled, wired and run tested. Contained within the unit shall be all factory wiring, piping, control circuit board, fan and fan motor. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, and an auto restart function. Indoor unit shall be charged with dry air before shipment from factory.

B. Unit Cabinet:
1. The cabinet shall be low profile, ceiling-concealed ducted not to exceed 7-7/8" in depth and equipped with four corner mounting brackets.

C. Fan:
1. The indoor unit fan shall be an assembly with Sirocco blowers per the following table:

Model	Number of Blowers	Number of Blower Motors	Blower Motor kW
SEZ-KD09NA-4	2	1	0.096
SEZ-KD12NA-4	2	1	0.096
SEZ-KD15NA-4	3	1	0.096
SEZ-KD18NA-4	4	1	0.096

2. The indoor fan shall be statically and dynamically balanced to run on a motor with permanently lubricated bearings.
3. The indoor fan shall consist of three (3) speeds, High, Mid, and Low.
4. The indoor unit shall have a ducted air outlet system and ducted return air system.

D. Filter:
1. Return air shall be filtered by means of a standard factory installed return air filter. .

Option: An FBL1 external filter box made of galvanized steel with flange connections to the indoor unit shall be furnished and equipped with one inch thick filters having a minimum MERV rating of 8.0.

E. Coil:
   1. The indoor coil shall be of nonferrous construction with smooth plate fins on copper tubing.
   2. The tubing shall have inner grooves for high efficiency heat exchange.
   3. All tube joints shall be brazed with PhosCopper or silver alloy.
   4. The coils shall be pressure tested at the factory.
   5. A condensate pan and drain shall be provided under the coil.
   6. The unit shall be provided with an integral condensate lift mechanism able to raise drain water 21 inches above the condensate pan.
   7. An optional drain pan level switch (DPLS1), designed to connect to the control board, shall be provided if required, and installed on the condensate pan to prevent condensate from overflowing.
   8. Both refrigerant lines to the indoor units shall be insulated.

F. Electrical:
   1. The unit electrical power shall be 208/230 volts, 1 phase, 60 hertz.
   2. The system shall be capable of satisfactory operation within voltage limits of 187-228 volts (208V/60Hz) or 207-253 volts (230V/60Hz).

G. Controls:
   1. The control system shall consist of a minimum of one microprocessor on each indoor unit and one in the outdoor unit, communicating via A-Control data over power transmission. The microprocessor located in the indoor unit shall have the capability of monitoring return air temperature and indoor coil temperature, receiving and processing commands from the wired or wireless controller, providing emergency operation and controlling the outdoor unit. The control signal between the indoor and outdoor unit shall be pulse signal 24 volts DC. Indoor units shall have the ability to control supplemental heat via connector CN24 and a 12 VDC output.
   2. For A-Control, a three (3) conductor 14 gauge AWG wire with ground shall provide power feed and bi-directional control transmission between the outdoor and indoor units. . If code requires a disconnect mounted near the indoor unit, a TAZ-MS303 3-Pole Disconnect shall be used – all three conductors must be interrupted.
   3. The system shall be capable of automatic restart when power is restored after power interruption. The system shall have self-diagnostics ability, including total hours of compressor run time. Diagnostics codes for indoor and outdoor units shall be displayed on the wired controller panel.
   4. Remote Controller
      Remote controller needs to be selected and ordered separately from the unit. Controller options are
      a. Wireless, wall mounted remote controller kit (MHK1)
         The Wireless, wall mounted remote controller kit (MHK1) shall consist of a wireless, wall mounted controller (MRCH1), a wireless receiver (MIFH1) and a cable (MRC1) to connect the receiver to the indoor unit. The controller shall be white in color with a light-green LCD display and a backlight feature. The MRCH1

shall consist of four Function buttons below the display, and Increase/Decrease Set Temperature buttons and a Hold button to the right of the display. The controller shall have a built-in temperature sensor and a battery holder, using two AA alkaline batteries. Temperature shall be displayed in either Fahrenheit (°F) or Celsius (°C), and temperature changes shall be by increments of 1°F (0.5°C).

The MHK1 uses Honeywell RedLINK™ technology, and the wireless receiver is specially designed for Mitsubishi units. Linking to the wireless network shall be done from the receiver and from the remote controller. There shall not be any interference with other wireless devices or neighboring RedLINK™ products. Communication shall be automatically restored after power resumes and after batteries are replaced.

The basic functions are:

Wireless, Wall Mounted Remote Controller Kit (MHK1)	
Item	**Description**
Number of Units Controllable	1 unit
ON/OFF	Run and stop operation
Operation Mode	Switches between Cool/Drying/Auto/Fan/Heat.
Temperature Setting (Range and modes depend on connected unit model)	Controller general setpoint temperature range: Cool/Dry: 50°F-99°F Heat: 40°F-90°F Auto: 50°F-90°F Controller temperature range when connected to the SEZ/SUZ system: Cool/Dry: 67°F-87°F Heat: 63°F-83°F Auto: 67°F-83°F
Fan Speed Setting (Range and modes depend on connected unit model)	Hi/Mid-2/Mid-1/Low/Auto
Air Flow Direction Setting (Air flow direction settings depend on the unit model)	Air flow direction angles 100%-80%-60%-40%, Swing.
Dual Setpoint Control	Separate heating and cooling setpoints. Adjustable deadband from 2ºF to 8ºF. Automatically adjusts setpoints to ensure deadband. System changeover with dual setpoints.

Wireless, Wall Mounted Remote Controller Kit (MHK1)	
Item	**Description**
Scheduling	5-2 and 5-1-1 schedules Separate Heat/Cool schedules Allows operation in AUTO with Scheduling setbacks and dual setpoint Simple temperature setting can be done up to 4 times one day in the week. The time can be set by the 15-minute interval. Remote controller shall be programmable as either a residential controller, which will offer residential scheduling options only; or as a commercial controller, which will offer commercial scheduling options only.
Optimal Start	Set occupied time and desired set temperature Remote controller learns when to start warm up or cool down so that space is at set temperature at start of occupied time
Operating Conditions Display	Setpoint and room temperature. Default sensing is at the remote controller. Installer setting to select at return air sensor. Automatically switches to return air sensor if communication to remote controller is lost Outdoor temperature and humidity (Requires optional air sensor MOS1)
Additional Functions	Hold Function Temporary Schedule Override Reset to factory default
Error	When an error is currently occurring on an air conditioner unit, the afflicted unit and the error code are displayed
Auto Lock Out Function	Setting/releasing of simplified locking for remote control settings can be performed. • Locking of all settings • Locking of ON/OFF setting • Locking of system setting (Heat, Cool, Off, Auto, etc.) • Locking of fan setting • Locking of temperature setting • Locking of Clock/Day/Schedule

Two optional devices can be used with the MHK1 controller kit. These are, an outdoor air sensor (MOS1), which allows the display of the outdoor temperature and humidity, and a portable central controller (MCCH1), which can control up to 16 zones with On/Off, set temperature, heat/cool mode selection and auto-off timer.

b. Wired Remote Controller (PAR-21MAA)

The Wired Remote Controller (PAR-21MAA) shall be approximately 5” x 5” in size and white in color with a light-green LCD display. The PAR-21MAA shall support a selection from multiple languages (Spanish, German, Japanese, Chinese, English, Russian, Italian, or French) for display information. There shall be a built-in weekly timer with up to 8 pattern settings per day. The controller shall consist of an On/Off button, Increase/Decrease Set Temperature buttons, a Cool/Auto/Fan/Dry mode selector, a Timer Menu button, a Timer On/Off button, Set Time buttons, a Fan Speed selector, a Ventilation button, a Test Run button, and a Check Mode button. The controller shall have a built-in temperature sensor. Temperature shall be displayed in either Fahrenheit (°F) or Celsius (°C), and Temperature changes shall be by increments of 1°F (0.5°C). The PAR-21MAA shall have the capability of controlling up to a maximum of 16 systems, as a group with the same mode and set-point for all, at a maximum developed control cable distance of 1,500 feet (500 meters).

Field wiring shall run directly from the indoor unit to the wired controller with no splices. The control voltage from the wired controller to the indoor unit shall be 12/24 volts, DC. Up to two wired controllers shall be able to be used to control one unit.

The basic functions are:

Wired Remote Controller (PAR-21MAA)	
Item	**Description**
Number of Units Controllable	16 units as 1 group
ON/OFF	Run and stop operation
Operation Mode	Switches between Cool/Dry/Auto/Fan/Heat.
Temperature Setting (Range and modes depend on connected unit model)	Sets the setpoint temperature in the following range Cool/Dry: 67°F-87°F Heat: 63°F-83°F Auto: 67°F-83°F
Fan Speed Setting (Range and modes depend on connected unit model)	Hi/Mid-2/Mid-1/Low/Auto
Air Flow Direction Setting (Air flow direction settings depend on the unit model)	Air flow direction angles 100%-80%-60%-40%, Swing.
Weekly Scheduler	ON/OFF/Temperature setting can be done up to 8 times one day in the week. The time can be set by the 1-minute interval.

Wired Remote Controller (PAR-21MAA)	
Item	**Description**
Operating Conditions Display	Setpoint and room temperature. Sensing can be done at the remote controller or the indoor unit depending on the indoor unit dipswitch setting Liquid, discharge, indoor and outdoor pipe temperatures LEV opening pulses, sub cooling and discharge super heat Compressor Operating Conditions: Running current, frequency, input voltage, On/Off status and operating time
Error	When an error is currently occurring on an air conditioner unit, the afflicted unit and the error code are displayed
Ventilation Equipment	Up to 16 indoor units can be connected to an interlocked system that has one LOSSNAY unit. LOSSNAY items that can be set are “Hi”, “Low”, and “Stop”. Ventilation mode switching is not available.
Auto Lock Out Function	Setting/releasing of simplified locking for remote control buttons can be performed. • Locking of all buttons • Locking of all buttons except ON/OFF button

c. Wireless, hand held remote controller (PAR-FL32MA)
The wireless had held remote controller (PAR-FL32MA) shall be used with a wireless receiver (PAR-FA32MA-E). The controller shall perform input functions necessary to operate the system. The wireless receiver shall be plug and fit compatible with the indoor unit.
The controller shall have a Power On/Off switch, Mode Selector – Cool, Dry, Heat, Auto, and Powerful Modes - Temperature Setting, Timer Control and Fan Speed Selector. The indoor unit shall perform Self-diagnostic Function and Check Mode switching. Temperature changes shall be in 1ºF (0.5ºC) increments with a setting range of 61 to 88ºF (16 to 31ºC).

4.08. Horizontal Ducted PEAD-A24AA4 Indoor Unit:

A. General:
The Ducted type indoor unit shall be factory assembled, wired and tested prior to shipment. Contained within the indoor unit shall be all factory wiring, piping, control circuit board, fan, and fan motor. The unit , in conjunction with the wired, wall mounted controller shall have a self-diagnostic function, 3-minute restart time delay mechanism, an auto restart function, an emergency / test operation. Indoor unit shall be charged with dry air before shipment from factory.

B. Unit Cabinet:

1. The cabinet shall be space saving, low profile, horizontal, ducted type. Formed cabinet shall be constructed of G-60 galvanized steel with factory applied foam surface insulation to prevent condensation on outer surfaces.
2. The cabinet shall be provided with four mounting brackets to accommodate suspension from threaded rod or structural support located on the side panels in all four corners. Brackets shall be suitable for supporting the weight of the indoor unit.
3. The indoor unit cabinet shall be equipped with a ducted air outlet and ducted rear return air connection. PEA units shall support an optional Bottom Return Adaptor. PEAD units shall have selectable rear or bottom return as a standard feature.
4. The PEAD units shall be equipped with a 3-15/16" (1000mm) diameter ventilation air intake knock-out.

C. Fan:
1. The indoor unit fan unit shall be an assembly with two (2) Sirocco fans direct driven by a single motor. Fan shall develop airflow to deliver up to 0.60 inches w.g. of external static pressure
2. The indoor fans shall be statically and dynamically balanced to run on a motor with permanently lubricated bearings.
3. The indoor fans shall operate on any of three (3) speeds, High, Mid, Low and Auto. The fan shall have a selectable Auto fan setting that will adjust the fan speed based on the difference between controller set-point and space temperature.
4. Indoor unit sound level shall not exceed:

Model / Speed	High	Mid	Low
PEAD-A24AA-4	37 dB(A)	34 dB(A)	30 dB(A)

D. Filter:
1. Return air shall be filtered by means of a standard factory installed return air filter. [Option: *Install filter rack assembly with replaceable 2" pleated filters, filter access panels, and mounting connections for connection to ducted indoor unit.*].

E. Coil:
1. The indoor unit coil shall be of nonferrous construction with pre-coated aluminum strake fins on copper tubing. The tubing shall have inner grooves for high efficiency heat exchange.
2. All tube joints shall be brazed with PhosCopper or silver alloy. The coils shall be pressure tested at the factory.
3. A condensate pan and with two (2) 1-9/32" (32mm) drains shall be provided under the coil.
4. In addition to the two (2) gravity drains, the indoor unit shall be provided with an integral condensate lift mechanism able to raise drain water 7-9/16" (700mm) above the condensate pan. Lift mechanism shall incorporate a safety sensor system to shut down the indoor fan in the event of high level of condensate in the drain pan. A secondary optional drain pan level switch (DPLS1), designed to connect to the control board, shall be provided if required, and installed on the condensate pan to prevent condensate from overflowing.
5. Both refrigerant lines to the indoor units shall be insulated.

F. Electrical:

1. The indoor unit electrical power shall be 208 / 230 volts, 1-phase, 60 hertz.
2. The system shall be capable of satisfactory operation within voltage limits of 198 volts to 253 volts.
3. The power to the indoor unit shall be supplied from the outdoor unit, using Mitsubishi Electric A-Control system.

G. Control:
1. The control system shall consist of a minimum of one microprocessor on each indoor unit and one on the outdoor unit, interconnected by single non-polar two-wire cables. The microprocessor located in the indoor unit shall have the capability of monitoring return air temperature and indoor coil temperature, receiving and processing commands from the wired controller, providing emergency operation and controlling the outdoor unit. The control signal between the indoor and outdoor unit shall be pulse signal 24 volts DC.
2. For A-Control, a three (3) conductor 14 ga. AWG wire with ground shall provide power feed and bi-directional control transmission between the outdoor and indoor units. . If code requires a disconnect mounted near the indoor unit, a TAZ-MS303 3-Pole Disconnect shall be used – all three conductors must be interrupted.
3. The system shall be capable of automatic restart when power is restored after power interruption. The system shall have self-diagnostics ability, including total hours of compressor run time. Diagnostics codes for indoor and outdoor units shall be displayed on the wired controller panel.
4. Remote Controllers
   All remote controllers need to be ordered separately from the unit.

   a. Wireless, wall mounted remote controller kit (MHK1)
      The Wireless, wall mounted remote controller kit (MHK1) shall consist of a wireless, wall mounted controller (MRCH1), a wireless receiver (MIFH1) and a cable (MRC1) to connect the receiver to the indoor unit. The controller shall be white in color with a light-green LCD display and a backlight feature. The MRCH1 shall consist of four Function buttons below the display, and Increase/Decrease Set Temperature buttons and a Hold button to the right of the display. The controller shall have a built-in temperature sensor and a battery holder, using two AA alkaline batteries. Temperature shall be displayed in either Fahrenheit (°F) or Celsius (°C), and temperature changes shall be by increments of 1°F (0.5°C).
      The MHK1 uses Honeywell RedLINK™ technology, and the wireless receiver is specially designed for Mitsubishi units. Linking to the wireless network shall be done from the receiver and from the remote controller. There shall not be any interference with other wireless devices or neighboring RedLINK™ products. Communication shall be automatically restored after power resumes and after batteries are replaced.
      The basic functions are:

Wireless, Wall Mounted Remote Controller Kit (MHK1)	
Item	**Description**
Number of Units Controllable	1 unit
ON/OFF	Run and stop operation

Wireless, Wall Mounted Remote Controller Kit (MHK1)	
Item	**Description**
Operation Mode	Switches between Cool/Drying/Auto/Fan/Heat.
Temperature Setting (Range and modes depend on connected unit model)	Controller general setpoint temperature range: Cool/Dry: 50°F-99°F Heat: 40°F-90°F Auto: 50°F-90°F Controller temperature range when connected to the PEAD/MXZ system: Cool/Dry: 67°F-87°F Heat: 63°F-83°F Auto: 67°F-83°F
Fan Speed Setting (Range and modes depend on connected unit model)	Hi/Mid-2/Mid-1/Low/Auto
Air Flow Direction Setting (Air flow direction settings depend on the unit model)	Air flow direction angles 100%-80%-60%-40%, Swing.
Dual Setpoint Control	Separate heating and cooling setpoints. Adjustable deadband from 2ºF to 8ºF. Automatically adjusts setpoints to ensure deadband. System changeover with dual setpoints.
Scheduling	5-2 and 5-1-1 schedules Separate Heat/Cool schedules Allows operation in AUTO with Scheduling setbacks and dual setpoint Simple temperature setting can be done up to 4 times one day in the week. The time can be set by the 15-minute interval. Remote controller shall be programmable as either a residential controller, which will offer residential scheduling options only; or as a commercial controller, which will offer commercial scheduling options only.
Optimal Start	Set occupied time and desired set temperature Remote controller learns when to start warm up or cool down so that space is at set temperature at start of occupied time
Operating Conditions Display	Setpoint and room temperature. Default sensing is at the remote controller. Installer setting to select at return air sensor. Automatically switches to return air sensor if communication to remote controller is lost Outdoor temperature and humidity (Requires optional air sensor MOS1)

Wireless, Wall Mounted Remote Controller Kit (MHK1)	
Item	**Description**
Additional Functions	Hold Function Temporary Schedule Override Reset to factory default
Error	When an error is currently occurring on an air conditioner unit, the afflicted unit and the error code are displayed
Auto Lock Out Function	Setting/releasing of simplified locking for remote control settings can be performed. • Locking of all settings • Locking of ON/OFF setting • Locking of system setting (Heat, Cool, Off, Auto, etc.) • Locking of fan setting • Locking of temperature setting • Locking of Clock/Day/Schedule

Two optional devices can be used with the MHK1 controller kit. These are, an outdoor air sensor (MOS1), which allows the display of the outdoor temperature and humidity, and a portable central controller (MCCH1), which can control up to 16 zones with On/Off, set temperature, heat/cool mode selection and auto-off timer.

b. Wired Remote Controller (PAR-21MAA)
The Wired Remote Controller (PAR-21MAA) shall be approximately 5” x 5” in size and white in color with a light-green LCD display. The PAR-21MAA shall support a selection from multiple languages (Spanish, German, Japanese, Chinese, English, Russian, Italian, or French) for display information. There shall be a built-in weekly timer with up to 8 pattern settings per day. The controller shall consist of an On/Off button, Increase/Decrease Set Temperature buttons, a Cool/Auto/Fan/Dry mode selector, a Timer Menu button, a Timer On/Off button, Set Time buttons, a Fan Speed selector, a Ventilation button, a Test Run button, and a Check Mode button. The controller shall have a built-in temperature sensor. Temperature shall be displayed in either Fahrenheit (°F) or Celsius (°C), and Temperature changes shall be by increments of 1°F (0.5°C). The PAR-21MAA shall have the capability of controlling up to a maximum of 16 systems, as a group with the same mode and set-point for all, at a maximum developed control cable distance of 1,500 feet (500 meters).
The control voltage from the wired controller to the indoor unit shall be 12/24 volts, DC. Field wiring shall run directly from the indoor unit to the wall mounted controller with no splices. Up to two wired controllers shall be able to be used to control one unit.
The basic functions are:

Wired Remote Controller (PAR-21MAA)	
Item	**Description**
Number of Units Controllable	16 units as 1 group
ON/OFF	Run and stop operation
Operation Mode	Switches between Cool/Dry/Auto/Fan/Heat.
Temperature Setting (Range and modes depend on connected unit model)	Sets the setpoint temperature in the following range Cool/Dry: 67°F-87°F Heat: 63°F-83°F Auto: 67°F-83°F
Fan Speed Setting (Range and modes depend on connected unit model)	Hi/Mid-2/Mid-1/Low/Auto
Air Flow Direction Setting (Air flow direction settings depend on the unit model)	Air flow direction angles 100%-80%-60%-40%, Swing.
Weekly Scheduler	ON/OFF/Temperature setting can be done up to 8 times one day in the week. The time can be set by the 1-minute interval.
Operating Conditions Display	Setpoint and room temperature. Sensing can be done at the remote controller or the indoor unit depending on the indoor unit dipswitch setting Liquid, discharge, indoor and outdoor pipe temperatures LEV opening pulses, sub cooling and discharge super heat Compressor Operating Conditions: Running current, frequency, input voltage, On/Off status and operating time
Error	When an error is currently occurring on an air conditioner unit, the afflicted unit and the error code are displayed
Ventilation Equipment	Up to 16 indoor units can be connected to an interlocked system that has one LOSSNAY unit. LOSSNAY items that can be set are “Hi”, “Low”, and “Stop”. Ventilation mode switching is not available.
Auto Lock Out Function	Setting/releasing of simplified locking for remote control buttons can be performed. • Locking of all buttons • Locking of all buttons except ON/OFF button

c. Wireless, hand held remote controller (PAR-FL32MA)
The wireless had held remote controller (PAR-FL32MA) shall be used with a wireless receiver (PAR-SA9CA-E). The controller shall perform input functions

necessary to operate the system. The wireless receiver shall be plug and fit compatible with the indoor unit.
The controller shall have a Power On/Off switch, Mode Selector – Cool, Dry, Heat, Auto, and Powerful Modes - Temperature Setting, Timer Control and Fan Speed Selector. The indoor unit shall perform Self-diagnostic Function and Check Mode switching. Temperature changes shall be in 1ºF (0.5ºC) increments with a setting range of 61 to 88ºF (16 to 31ºC).